

WOLDERT (A.)

Mosquitoes And Malarial Fever

With

Anatomy of The Mosquito. (Woldert).

Case.

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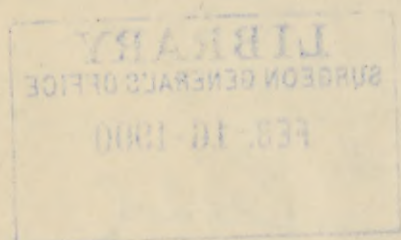
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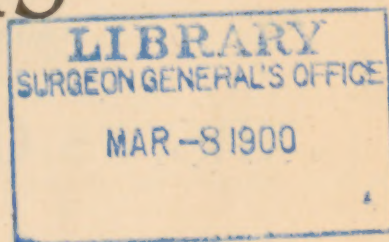
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MOSQUITOES AND MALARIAL FEVER.

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A PRELIMINARY INVESTIGATION OF THE
THEORY OF THE INOCULATION OF
MALARIAL FEVER THROUGH THE
AGENCY OF MOSQUITOES.

BY ALBERT WOLDERT, M.D.

PHILADELPHIA.

The inoculation theory of malarial fever through the agency of mosquitoes is not a new one. It is said to have been mentioned by Roman writers about the time of the Christian era. Linne¹ and Sir Henry Holland viewed the transmission of malarial fever through the bite of the mosquito favorably. In 1807 Crawford¹ published a paper on "the Mosquitul Origin of Malarial Fever," and King², in 1883, one on the same subject. It, however, remained for Patrick Manson to lay the foundation on which Ronald Ross has raised the superstructure of so many facts in connection with this important question. Battista Grassi probably formulated the axiom, *laddove c'è malaria ci sono zanzare*—where there is malaria, there are mosquitoes. Manson, after a long series of deductions, finally arrived at the conclusion that the mosquito acted as the intermediary host in the propagation of the malarial parasite, and published his most convincing paper on the subject in 1894. In the Goulstonian Lectures delivered in 1896 he further explained his convictions in regard to this theory. These publications of Manson influenced Ross to carry on the investigations which culminated in the present work now transpiring in various parts of the world. After Ross came Grassi, Bignami, Bastianelli, Celli, Marchiafava, and Dionisi of Italy, and later came Koch of Germany. The observations of Ross have been concurred in by Koch, Kossel, Nuttall, and Pfeiffer of Germany, by Laveran and Metchnikoff of France.

REASONS URGED AGAINST THE ACCEPTANCE OF THE
THEORY.

Objections to the theory are many. One is that the entire subject is too new. Most men will probably agree that it is not the usual way in which infectious diseases are conveyed to man, and from one person to another. Again, it may be urged that the theory is against experience on this question; that only a few species of mosquitoes are capable of inoculating the disease; that observers, through their zeal, have mistaken artifacts for other than the spores of the malarial parasite; and lastly, one may ask, why should the malarial parasite choose the mosquito to act as the intermediary host in the perpetuation of its species? It is not the purpose of this paper to attempt to answer these objections. "Good reasons must perforce give place to better."

NATURAL ORDER OF MALARIAL PARASITES.

The natural order to which all recognized forms of malarial parasites belong, whether in man or birds, is to the order of *Gynosporidia*, class *Sporozoa*.

The foundation for the theory of the inoculation of malarial fever in the case of man has been built upon the experiments with bird-malaria—*Proteosoma* (Grassi), and *Halteridium* (Labbé).

HOW THE SPORES OF PROTEOSOMA ARE SUPPOSED TO BECOME STORED UP IN THE BODY OF THE MOSQUITO.

According to the theory of Manson, the first stage necessary for the propagation of the malarial parasite in the system of the mosquito is the development of flagellated bodies, which in turn become fertilized, after which they become more motile and penetrate the stom-

1. Baltimore Observer.
2. Popular Science Monthly.

ach and intestinal walls of the insect. Lodging in the muscular layer of these organs, a coccidium (zygote) or cyst is developed in which develop germinal rods or spores. After the lapse of seven or eight days it is believed this coccidium ruptures, setting free the spores into the body-cavity of the mosquito, thus entering the blood, by which they are conveyed to the veneno-salivary glands, where they become stored up to be inoculated into man at the moment the insect bites. The veneno-salivary—or venomo-salivary—glands are two in number, and located one on each side of the insect's neck. Each consists of three lobes, the latter of which communicates with the proboscis or beak by means of a duct which bifurcates in front of the esophagus in the shape of the letter Y. Two of the lobes of each gland are supposed to be salivary in function, while the central lobe is believed to pour out a secretion which has the power to cause constriction of the blood-vessels, or which has the power of coagulating albuminous substances. These secretions are ejected at the time the insect bites. It is known that the bite of this insect does not give rise to hemorrhage which is believed to be due to the properties of the secretions from these glands.

DEVELOPMENT OF THE GERMINAL RODS OR SPORES OF HALTERIDIUM AND PROTEOSOMA.

MacCallum, experimenting on birds whose blood contained *Halteridium*, observed that the parasites escaped from the infected corpuscles. After the lapse of a certain period they assumed a spherical form, and some of them emitted flagellæ which became detached and, after swimming about for a time, subsequently approached other spheres, which they entered, thus causing impregnation. Watching one of these impregnated bodies, he found that renewed vigor was manifested by very active motion and the power to penetrate both white and red blood-corpuscles. This same process occurs in the case of *Proteosoma*. It is believed that this impregnated body has the power of penetrating tissues and, after being formed in the stomach of the mosquito, finally penetrates its walls, and afterward forms the coccidium with its contained spores—germinal rods or germinal threads.

With certain modifications analogous processes are supposed to occur in the body of the mosquito, in the case of the human malarial parasite, to that observed in *Halteridium* and *Proteosoma*.

BIRD-MALARIA.

Ross has studied both species of bird-malaria, the results of which have been recorded by Manson as follows: The characteristics of *Halteridium* are that it extends along the nucleus of the red blood-cell and forms sporulating appendages at the end of this halter-shape of jugum. On the contrary, the *Proteosoma* sporulates in a different fashion. It is a more concentrated parasite, so to speak, occupying rather the center of the oval red blood-corpuscle, and, in order to obtain room, displaces the nucleus latterly. Both species of these parasites resemble the human malarial parasite in their structure. They are both intracorpuseular; they are both composed of pale protoplasm carrying a large number of grains of black pigment; they also sporulate and form flagellated bodies, so that in every way they seem strictly analogous and closely allied to the human malarial parasite. Bird-malaria in the tropics is prevalent in the warm season. Out of 111 wild sparrows caught in Calcutta, Ross found that 15 or 13 per cent. were suffering from *Proteosoma*. In most of these, the parasites were few in number and, excluding two of them, an average of only one parasite was found in each microscopic field.

THE FLAGELLATED MALARIAL PARASITE.

It was formerly held by some observers that the flagellated body represented a degenerated form of plasmodium, but through the patient investigations of Dock, MacCallum, and Ross it would appear that such does not hold good. In a letter to Manson, Ross tells of the following experience while examining the blood from a patient suffering from malarial fever: "I said I was going to watch free flagellæ. I found one in my first specimen and watched it continually for three hours. So much for the statement that free flagella soon become quiescent and vanish in the serum. At first it wriggled about for twenty minutes like a trypanosoma so that I could hardly follow it. Then it brought up against a phagocyte and remained there so long that I thought the phagocyte had seized it. Not so; it was neither killed nor sucked in, but was actively engaged in attacking the phagocyte. The flagellum kept at this for about a quarter of an hour and then wriggled away across two fields and in the direction of another phagocyte. Into this second phagocyte it pushed in several places with one of its ends and the phagocyte seemed to rear up and try in vain to get round and envelop the flagellum. At last the phagocyte seemed to give up the struggle and flatten out itself against an air bubble, the flagellum still attacking it. After fifty minutes and when the flagellum seemed to be getting exhausted a very curious thing happened. A third phagocyte approached coming rapidly across the field; but it had no sooner got near when the flagellum left its fallen foe and attacked a new one, holding on to it and shaking like a snake on a dog. In one minute the third phagocyte turned sharp round and quickly made off; it went right across a whole field the flagellum holding on. This continued for five minutes, after which the flagellum left the phagocyte. By this time the flagellum had become much more visible and had a large swelling in the middle. I watched it steadily as its movements became gradually slower. It was certainly able to attach itself to the cover glass (as shown by touching this with a pen) by either end, and even perhaps by the swelling. At last this swelling moved to one end nearly, and became very large and distinct until after three hours the creature evidently died; at any rate it curled up and ceased to move."

After penetrating the walls of the stomach and intestine of the mosquito, ~~and after the stomach and intestine of the mosquito,~~ and after the formation of the coccidium and germinal rods, this insect is supposed to act as the intermediary host of the malarial parasite in the same way as it does in the case of *Filaria Nocturna*, *Filaria Medinensis*, *Cyclops quadricornis*; and in the same way as do swine in tenia solium, and trichina spiralis. And it is further held that the malarial parasite is capable of being inoculated into man by the mosquito in the same way as is Texas fever into cattle by the bite of the tick—*Boophilus bovis*—and the tsetse-fly disease by the bite of the tsetse-fly—*Glossina morsitans*.

BIRDS INFECTED WITH PROTEOSOMA THROUGH THE AGENCY OF MOSQUITOES.

Ross found that mosquitoes fed on birds infected with *Proteosoma* contained enormous numbers of germinal rods within the veneno-salivary glands. He subsequently allowed these to feed on birds in which there were no parasites of *Proteosoma*, with the result that they became infected with the disease in from five to eight days. Ross, experimenting further with *Proteosoma*, found

that by feeding gray mosquitoes on sparrows, larks and crows containing this parasite, he was able to recover the pigmented bodies characteristic of this organism, within the tissues of the mosquito. Of 245 gray mosquitoes fed on sparrows whose blood contained the *Proteosoma*, 178, or 72 per cent., showed the pigmented bodies, while in 249 fed on the blood of sparrows devoid of this parasite, not one showed the pigmented cells in the walls of its stomach. Out of 28 originally healthy sparrows subjected to the bites of gray mosquitoes—previously fed on diseased sparrows—22, or 79 per cent., became infected within from five to eight days. Out of 22 birds experimented on by Daniels in the same manner, 54 per cent. became infected. Ross collected the larvæ of mosquitoes and kept them until they became adults, when he allowed ten of them to bite birds in which the *Proteosoma* were very abundant, and in dissecting out the stomach of the mosquito he found an average of 100 pigmented cells. Ten of these mosquitoes were next fed on birds in which the *Proteosoma* was only of a moderate quantity, and only an average of 29 pigmented cells were found; while of ten fed on birds containing no *Proteosoma*, no pigmented cells were found.

MAN INFECTED WITH MALARIAL FEVER THROUGH THE AGENCY OF MOSQUITOES.

Reasoning by analogy of what had been found in the case of *bird-malaria*, Amico Bignami, of the Institute of Pathological Anatomy of Rome, under the direction and supervision of Battista Grassi, records the following experiments made on man: "Thus was begun, on September 26, 1898, the third experiment. S—, who was by this time completely recovered from the indisposition following upon the preceding experiment, again consented to be the subject. I could not find any one else intelligent enough to understand the importance of the test and so self-denying as to submit to it. Along with S— there slept in the mosquito-room another patient with nerve disease who, like S—, had never had malaria, nor as far as we were aware had never been exposed to the infection. And for a couple of nights a third patient, also a nerve case, slept in the room, but with this man the experiment was not continued. On October 3, I was obliged, for want of more material, to suspend the experiment. On the 10th to the 14th, there was an abundant supply of mosquitoes. On the 10th, S— complained of headache. On the evening of the 16th, at 6 p. m., his temperature was 37 C., and on the following day he felt better. From the 17th to the 21st, there were but few mosquitoes left in the room; nevertheless both patients showed evidences of having been bitten. From the 19th to the 23d, no fresh mosquitoes were brought; on the 23d, there was a new but small supply. From this day onward until the experiment came to an end there were but very few mosquitoes in the room. The patients were, however, certainly bitten. During the last days of October S— complained of malaise and headache. On October 31, his temperature showed a slight elevation to 37.2 C. (99 F.). On November 1, at about 3 p. m., he was seized with shivering which lasted until 5 p. m., the temperature rising rapidly to 39 C. (102.2 F.), between 9 p. m. and 10 p. m., when he again experienced a sense of chilliness. The fever continued all night. On the morning of November 2, his temperature was lower and during the night remained at 39 C. (102.2 F.), and on the morning of the 4th it rose to 40.4 C. (104.7 F.), the patient being in great agitation and suffering. A careful examination of the blood made on November 2, gave a negative result;

in spite of the most diligent search not a parasite was found. On the morning of November 3, I found young ameboid parasites, few in number, mobile or discoid and without pigment. These went on increasing in number during the course of the day and in the afternoon were present in considerable quantity, some of them presenting pigmentation at the edges, the pigment being in fine granules. They stained with Romanowsky's method and with eosin and hematoxylin. The parasites belonged to the estivo-autumnal variety. The room in which the experiment was carried out forms one of the annexes of the San Carlo ward where none of the physicians have ever known an autochthonous case of malarial fever to occur, nor has malarial fever ever been known to originate in any of the neighboring towns. This fever then, identical with those prevalent at Maccarese, was contracted by S— in surroundings in which there was neither water nor the soil of Maccarese (the mosquitoes having been sent from the latter place), but only its mosquitoes. Hence we are forced to the conclusion that the fever was actually inoculated by these mosquitoes. The varieties of mosquitoes experimented with were the *Culex penicillaris*, the *Culex malaria* (so-called) and *Anopheles claviger*, but of this last species only a few individuals were sent and only on one occasion during the course of the experiment."

At the present time it is claimed that the *Anopheles claviger* is the species of mosquito most concerned in the propagation of the malarial parasite. Grassi claims that he first discovered that the *Anopheles superpictus* could carry malaria, and was first to claim that all species of *Anopheles* could propagate it.

It has been said that the mosquito does not harbor the malarial parasite throughout the entire year, and that from January to May the forms are absent from this insect. Just how long the insect may live under favorable circumstances has not been definitely proven. In cold climates, should they find a suitable place, such as cellars or barns, they probably survive the winter. Many of the adult females die soon after depositing their eggs, and their bodies are readily devoured by the young larvæ, which are said to possess ravenous appetites. Ross has found the alimentary tract of the larvæ stuffed with the scales, fragments, limbs, and other remains of the parental insect. In this way it is supposed the malarial parasite may pass from one generation of mosquito to the next.

THE COCCIDIA OF PROTEOSOMA.

The youngest coccidia (or xygotes) of *Proteosoma* which have been discovered are those seen on the second day. At this time they have been described as being small oval bodies about 8 microns in the long diameter, and containing numerous fine pigment granules. They grow rapidly until the sixth day, and when they may attain the diameter of 60 or 70 microns, and on the seventh day are said to be mature zygotes. About the second or third day a faint capsule develops around the parasites, in which may be seen pigment granules and vacuoles. The pigment granules are often arranged concentrically as seen in diatoms. On the seventh or eighth day the coccidia are seen to contain 1, a large number of delicate thread-like, spindle-shaped reproductive bodies—germinal threads, germinal rods, sporozoites, sporozooids, spores, zygotoblasts; 2, a smaller number of large black sausage-shaped bodies, the nature of which has not been determined. The germinal threads are said to be from 12 to 16 microns in length, and about 1 micron in width, slightly twisted, and in the third dimension are flattened. The middle portion of the germinal thread

contains vacuoles and chromatin granules, and is much wider than either extremity, which is pointed.

The large black sausage-shaped bodies when mature are from 16 to 20 microns or more in length and from 2 to 3 microns in thickness. They have been described as having a cylindric shape, curved, sigmoid, or variously twisted. Ross has found germinal rods together with these black bodies contained within the same coccidium. They have been fed by the mouth, to sparrows, without giving rise to *Proteosoma*. Ross is of the opinion that they may be able to infect the larvæ of the mosquito at the period of maturation.

WHERE THE COCCIDIUM AND GERMINAL THREADS OF
PROTEOSOMA ARE FOUND IN THE TISSUES OF
THE MOSQUITO.

The coccidium (zygote) of the *Proteosoma* has been most frequently found in the stomach and intestinal walls of the mosquito, while the germinal rods are for the most part found stored up in the venomo-salivary glands and ducts. But the latter have also been found dispersed throughout the insect's body. Ross thus describes the tissues of the stomach of the mosquito: "If you examine a mosquito's stomach with a microscope (1-12 oil-immersion lens), you will find the wall is made up of several layers. The outside layer is composed of ramifications of the air vessels of this insect. Beneath this you will find a structureless sort of membrane which does not stain easily; and below this again and forming the lining membrane, the mucous surface, so to speak, of the mosquito's stomach, what might be called the epithelial layer, composed of several strata of cells. The pigmented cells of *Proteosoma* do not occur as might be supposed among the soft epithelial cells lining the inner surface of the stomach, but they lie in the outer homogeneous layer covering this or between the meshes of the muscular fibers." On dissecting out the insect's stomach, he found that by exercising only slight pressure on the cover-slip the coccidium ruptured, setting free myriads of germinal threads. The germinal rods have been found in greatest abundance in the venomo-salivary glands. Here they lie scattered both within and without the cells, while the salivary duct has been found to contain myriads of them. As a rule more sporozoites are found in one gland than in the other. They have also been found in the blood, muscular tissue, and juices of the head and thorax of the mosquito. The black bodies have been found in the muscular and connective tissue of this insect (?).

OTHER PARASITES FOUND IN THE BODY OF THE MOSQUITO.

Besides the coccidium, bodies of *Proteosoma*, other parasites have been found in the body of the mosquito, e. g., a nematode, a fungus, a gregarine, a sarcosporidium (?); a coccidium (?) and certain swarm spores, besides one or two doubtfully parasitic forms; yet Ross has been unable to trace any of these parasites to the ingestion of malarial blood, nor has he observed special protozoa in the evacuation due to such ingestion.

DISCOVERY OF PIGMENTED CELLS IN MOSQUITOES WHICH
HAVE BEEN FED ON MEN SUFFERING FROM
MALARIAL FEVER.

The changes which have been found to occur in the system of the mosquito in avian malaria are, with certain modifications, supposed to also occur in the case of human malaria. Many theories remain unproved. On Aug. 16, 1897, Ronald Ross allowed eight mosquitoes—genus *Anopheles*—to feed on a patient whose blood

contained crescent malarial parasites. Four of them were killed at once, for the purpose of studying flagellated bodies. Of the remainder, two were examined on the 18th and 20th days respectively, without anything being noted. The seventh insect was killed on the 20th, four days after having been fed. In the upper half of the stomach, lying among or within the cells, a dozen round or oval—12 to 16 microns in diameter—pigmented cells were found. The outline was said to have been sharp and colorless, without nucleus, and the contents were filled with vacuoles. Each cell contained from ten to twenty black or dark pigment granules identical in appearance with the well-known and characteristic pigment of the malarial parasites—large quartans and crescents—derived spheres. These cells were devoid of contractile, intracellular or ameboid movement. The pigment granules were not scattered throughout the cell body, but arranged in lines transversely or peripherally, or in small circles round the center. They did not become more refractive on change of focus. In some cases the pigment granules showed a rapid oscillation, but did not change their relative position in the field. "Owing to their blackness, so different from the bluish yellow and green granules and debris found in and about the neighboring cells, they arrested the eye at once. Upon being irrigated with a 40 per cent. solution of formalin, the bodies became more visible than before, as compared with the stomach cells." On the fifth day other similar cells were found nearer the esophageal end of the stomach and were distinctly larger and more substantial than on the fourth day, and had a thicker outline.

Manson states that Bignami and his co-workers found that two days after the estivo-autumnal blood rich in crescentic bodies had been taken into the stomach of the mosquito, the coccidium forms had found their way into the stomach and intestinal wall, and lay encapsulated between the muscle fibers. On the sixth day they had increased enormously in size, and projected into the lumen of the alimentary canal. Very gentle pressure at this stage sufficed to rupture the cyst and set free the germinal rods or spores.

A correspondent of the *British Medical Journal*, of recent date, writes that during the fever among the West Indian troops at the suburb of the Wilberforce barracks, mosquitoes are caught and examined daily, and found to belong to the genus *Anopheles*. All varieties of fever are said to prevail there, and it is presumed that the genus is capable of giving rise to all kinds of malarial fever. He states that the parasites have been found in all stages, namely, the young zygotes and the mature ones, and the zygoblasts or germinal threads have been found in the veneno-salivary glands of this insect. The quartan and tertian can be recognized by their contained pigment, that of quartan being of a dark-brown color and comparatively scanty, that of tertian being copious and fine and of a light-brown color. The youngest tertian zygotes are said to resemble the mature gametocytes, non-sporulating forms found in the human blood itself. "They differ from those of *Hemameba relicta* '*Proteosoma Grassii*' by being considerably shorter, thicker, and less twisted and bent, and lie in bundles, and not irregularly placed in the gland." In one insect in which the stomach showed numerous empty capsules, the salivary cells were packed with numerous hosts of zygoblasts, bundles of which could be seen lying outside the cells, but within the containing capsule of the gland; while other bundles lay within the cells, others again were making their way into the central duct.

The duct itself was said to have been crammed with these bodies lying parallel to its axis. The insects were caught gorged with human blood and kept two or three days until the meal was evacuated; they were then examined and found to contain zygotes of the second and third day, or zygotes corresponding to the time elapsed since the insect was fed, while at the same time older zygotes were found, showing that these had been infected at a previous meal.

It is believed that when the insect bites, not all the germinal threads escape from the venomo-salivary gland, hence any number of persons may become infected by a single mosquito. It is stated by Bignami and Bastianelli that certain differences exist in the arrangement of the sporozoids—germinal threads—in the sporozoon in the different forms of malarial fever. The sporozoids are more regularly arranged in the capsule of the tertian, and from this disposition of the sporozoids they are able to distinguish whether a mosquito is infected with a tertian or estivo-autumnal parasite.

The *zygotes of human malaria* are differentiated from bird-malaria, as has been mentioned, from the fact that in the former they are considerably shorter, thicker, and less twisted and bent, and they lie in bundles and not irregularly placed in the venomo-salivary gland.

NOMENCLATURE OF SEXUAL ELEMENTS OF THE MALARIAL PARASITE.

Before sporulation the elements are spoken of as "gametes," and after fertilization they become the zygotes. "Gameti" forms are sexually-mature forms. Bastianelli and Bignami designate the flagella by the term "microgameti." In the case of the tertian parasite the bodies are divided into two forms, namely: "microgametocytes" or male, and "macrogametocytes" or female forms. The nucleus of the microgametocytes is centrally located, and the chromatin is abundant and in filaments, while in the macrogametocytes the chromatin is scarce and occurs in the form of granules. The flagellated organisms are sometimes spoken of as "spermatoids," while the larger non-flagellated bodies are denominated "ovoids." Fertilization of the elements is believed to occur in the system of the mosquito, while in man it is believed that they remain *sterile*.

On Aug. 27, 1899, Ross sent a telegram from Las Palmas, Africa, to the Liverpool School of Tropical Medicine, announcing that the complete life-cycle of the quartan parasite had been demonstrated on mosquitoes in the same manner as that of tertian and estivo-autumnal fevers. The genus *Anopheles* was used.

(To be Continued.)

of the head for a short time. There was no strabismus; the ophthalmologic examination made by Dr. C. P. Pinckard showed both fundi normal. The child was unusually bright and active, and of excellent physical development, and remained at the hospital for forty-seven days.

The physical examination, except the points already referred to, was negative.

Treatment: Bromid of soda was administered in 3-gr. doses three times daily, and the child nursed at the mother's breast, and placed under the best possible hygienic conditions. The child improved very much, though at time of its discharge it occasionally showed some rotatory movements of the head and slight nystagmus.

A disease which has been frequently confused with spasmus nutans is eclampsia nutans, or the saalam convulsions described by the older authors. West³ says that children who are attacked with this disease bend the head and body slightly forward, a movement which is continued with great rapidity, sometimes twenty, fifty, or even a hundred times, and then ceases, but returns once or oftener every twenty-four hours. During the attack the child seems bewildered, but complete consciousness returns as soon as the movement ends. In addition to these attacks, there is a general failure of health and enfeeblement of the mental powers. The tendency of the disease is to pass into confirmed epilepsy. Soltmann⁴ and Gerhardt⁵, both of whom have written treatises on spasmus nutans, do not separate it from eclampsia nutans. Gerhardt distinguishes two varieties of the nodding disease, a mild and a severe form. The mild, he maintains, is a reflex spasm, and the severe form is due to some variety of meningeal irritation, though he adds that the precise pathologic anatomy is not known. The severe cases terminate in idiocy or epilepsy. The latter variety, it is obvious, is to be classified as cases of eclampsia nutans. In more recent times there has been a tendency to omit the term spasmus nutans from the nomenclature, and to describe the disease under a variety of other names. Thus Caille¹² describes "two cases of nystagmus associated with clonic movements of the head in rachitic babies." Peterson⁶ reports five cases under the name of "gyrospasm of the head." Samuel Gee⁷ describes the condition as "head-shaking in children," and Holt⁸, under the name of "rotatory and nodding spasm of the head." W. B. Hadden⁹ refers to the condition as "head-nodding or head-jerking." Dawson Williams¹⁰, in a recent treatise on the "Diseases of Infancy and Childhood," speaks of "clonic spasm of the neck," which may be rotatory or lateral. Spasmus nutans, he erroneously remarks, is sometimes called eclampsia nutans. R. W. Raudnitz¹¹, in a very exhaustive monograph treating of this subject, retains the name spasmus nutans. This nomenclature has the advantage that it prevents the evercontinuous multiplication of terms to describe one and the same disease, and it also has a historic and clinical value in that it preserves for us a description of the earliest cases of eclampsia nutans with cases of spasmus nutans.

Head movements: The head may move at the rate of 80 or 100 times per minute, though the movements may be as rapid as 120 or 160 times per minute, particularly if the child be excited. The movements consist in oscillations from left to right or right to left. Peterson⁶ reported five cases, all of the rotatory variety, and he described them under the name of gyrospasm. Of the 15 cases reported by Raudnitz¹¹, 5 showed nodding movements, 6 rotatory movements and 2 were of the mixed

type, i. e., sometimes the rotatory and other times the nodding movements occurred. In 2 cases no movements of the head were noted. Frequently the first manifestation of the disease is a wryneck, and then this is followed by the head movements or the nystagmus. The onset of the disease in any case is gradual.

Caille¹² observed that the head movements cease when both eyes are bandaged. Raudnitz confirmed this observation in a number of his patients. He also observed that the wry-neck ceased when both eyes were bandaged. He found, in a certain proportion of his cases, that the movement ceased if one eye was bandaged.

The nystagmus: While there are cases of genuine spasmus nutans reported in the literature where nystagmus is said to have been absent, nevertheless recent studies teach that nystagmus is present at some time during the course of every case, though it may disappear before the involuntary head movements have ceased. The nystagmus may be present in one or both eyes. It occurs later than the other symptoms, and disappears, as a rule, before other spasmodic movements, though cases do occur where the nystagmus is the most prominent symptom. In regard to the direction of the oscillations of the eyeballs, we find that various combinations occur. Thus the movements may be horizontal in both eyes, or vertical in both, or the movement may be so arranged that vertical, horizontal and diagonal oscillations occur in the same eye at different times. The movement in one eye may be more marked than in the other, or the nystagmus may be absent in one. Peculiar temporary changes occur in the position of the eyes, adduction of one is frequent, abduction occurs less often. Spasmodic movements of the lids is of frequent occurrence, though excessive secretion of tears is seldom observed. Cases of strabismus have been reported by most observers. The fundus of the eye has been reported as normal.

Etiology: Much speculation has been indulged in as to the cause of this disease. The older authors disposed of the etiology by considering the condition to be of reflex origin; thus Hensch² attached great importance to dentition, but we know that the disease occurs commonly before the period of dentition, and also after the temporary teeth have appeared. Derangements of the alimentary canal have been considered the cause. Rickets is so commonly found associated with the disease that it has been rather generally regarded as bearing a causal relation to it. Raudnitz¹¹ found rickets present in 14 out of his 16 cases. Dickinson¹³, Hadden⁹ and Caille¹² offer corroborative statements.

Head injury not uncommonly precedes the disease, thus, in 3 of Hadden's cases and 2 of Peterson's, as well as in 1 of my own, the history of traumatism could be obtained. Holt⁸ suggests that possibly the disease is a variety of cerebral concussion. B. Sachs¹⁴ says that if the condition be developed in late years, it may be regarded as a habit, but if the movements begun in early infancy are associated with nystagmus, strabismus or idiocy, one need not hesitate to refer them to a cerebral lesion. The region of the cranial nerve nuclei, he says, would most probably be the seat of the trouble, and the lesion we must suppose to be irritative in character. Many facts in the clinical history of these cases would speak against this latter view. The fact that most of these children are vivacious and intelligent, and tend in a comparatively short time to make a spontaneous recovery would cause us to doubt the existence of a central lesion. And, again, nystagmus of central origin is accompanied by a train of other symptoms which have not been observed in the cases of spasmus nutans.

important technical questions which really have no bearing on the main problems of the dangers and uses of alcohol.

PRACTICE AND DIPLOMA-MILLS.

The newspapers announce that one of the "doctors" who was refused a certificate by the Wisconsin Board of Medical Examiners has commenced suit against the members of the Board to compel them to issue him the coveted certificate. The "college" which gave the complainant a diploma is assisting in the prosecution, and he is likewise being backed by others who have a grievance against the Board and the principles it represents. The question arises: What are the physicians of Wisconsin doing to aid the Board in its fight? There is in Chicago a man who has been making money by running a diploma-mill, and selling diplomas. He has been at it for years, under one plan or another, and has found the occupation decidedly profitable, and an easy way of making a living. The present medical practice acts of Illinois having taken away this man's calling, he has organized a medical liberty (?) league, or something of the kind, for the purpose of fighting the Illinois State Board of Health and the medical laws of the state. United with him are those who oppose everything which tends to raise the standard of education in the medical profession. And again the question arises: What are the physicians of Illinois doing to assist the Board in the fight?

RELIGIO-MEDICAL QUACKERY.

The prophets of the various "healing" Zions of the day are keenly alive to the profits. Brigham Young died a millionaire, Mrs. Eddy is said to have acquired great wealth, and Dowie is investing heavily with the funds derived from the faithful. We have not found any of them, except perhaps "crazy Schlatter," without a very comfortable place to lay their heads, or at all inclined to sell all they have and give to the poor—the giving is the other way, it is the poor that give to them. We admire thrift, and have no special sympathies with the sentimental socialism of the day that holds the world is going to ruin because some people are rich, but we confess to a natural dislike to seeing fortunes acquired by such methods. In comparison with these self-sanctified money accumulators the worldly fraud who heals by "magnetic power" seems even respectable, and osteopathy almost scientific. The love of money, we are told, is the root of all evil, and we have evidence that it is certainly at the bottom of the religio-medical humbugs who are just now afflicting civilization.

EARLY NOTIFICATION OF MENTAL DISEASE.

Dr. Walter Channing, in a letter to the *Boston Herald*, makes the suggestion that there should be a compulsory notification of all cases of suspected or developed mental diseases. His letter is instigated by a recent case of murder and suicide by a well known professional baseball player, whose peculiarities had been noticed for some time by his associates, though no attempt had been made to guard against the event that was at least partially foreseen. There is much force in Dr. Channing's suggestion: a persecutory delusional paranoiac is a stand-

ing danger and many tragedies are the direct result of such patients being at large and unwatched. As the Doctor says, there is no necessary disgrace in being insane; it does not imply any essential moral defect, but it is a misfortune that should not be permitted to extend itself to others by the irresponsible acts of the victim. The notification and early treatment and watching of these patients would also be to their own advantage, and in case of some forms of derangement might lead to an early recovery, while without it the case might progress to a hopeless stage. If every physician who recognizes a possible case of dangerous insanity was compelled to report it to the proper authorities, and the latter would require that the subject be placed under proper control or committed to a public institution, we would have fewer dangerous and troublesome cranks at large, fewer tragedies to record, and would be spared an occasional judicial murder. There are, it is true, difficulties in the way, but they can be overcome and the law would have an excellent effect. One who, like Dr. Channing and other alienists, has given attention to this subject can realize the public and private dangers from the common neglect in these matters. The Doctor's suggestion is a sensible one that is worth considering by the authorities and the community.

GOVERNMENTAL EMPLOYMENT FOR DENTISTS.

The *Army and Navy Register* of January 27 is responsible for the following:

Need of Army Dentists.—A mail report received from General Otis states that the teeth of nearly every man in the islands are in bad stages of decay and recommends that a number of dentists be sent from the United States to look after the teeth. He states that after a careful investigation, he finds that a year of life in the tropics, living on army rations, has almost completely ruined nearly 50 per cent. of the teeth, while those of the remaining soldiers are in various bad stages of decay. The report was sent to Surgeon-General Sternberg, who wrote: "I am of the opinion that the appointment of competent dentists to the Army is an absolute necessity. I have long been of the opinion that there should be some systematic way by which the teeth of every enlisted man could be inspected at least once in a year, and preferably once in six months. There are few civilians who permit their teeth to be neglected for so long a period as six months. The condition of the teeth is reflected in the physical condition of the individual. If the teeth are bad, ache much, or do not perform their functions properly in the mastication of food, the health of the soldier is seriously impaired. I strongly indorse the proposition, and suggest that one dental surgeon, with the rank of major, be appointed for each regiment." A bill has been drawn up by the direction of the Secretary of War, which will undoubtedly be passed by Congress. The bill provides that the surgeon-general of the army, with the approval of the Secretary of War, shall employ and appoint dental surgeons to serve the officers and enlisted men in the regular and volunteer army, in the proportion of one dental surgeon to every 1000 men in the said army.

We have heard a great deal recently about the unsuitability of the army ration for troops in the tropics, but this is the first occasion on which reference has been made to the rapid decay of the teeth as a diseased condition prevalent in the tropics, for which the army ration is held in part responsible. We know that the teeth of every candidate for enlistment are carefully examined by medical men attached to the recruiting service, and that ordinarily the teeth of men of the military age are not subject to such wholesale and rapid decay as repre-

sented in the mail report said to have been received from General Otis. We were therefore so little impressed with the above statement of the ravages of dental caries among the troops in the Philippines that, had the paragraph ended here, we would have regarded it as one of those vague exaggerations which occasionally get into print through the medium of inexperienced reporters on the look out for something sensational. An air of indisputable fact is, however, given to the statement by the opinions and recommendations of Surgeon-General Sternberg, not as heard and reported by one liable to misapprehend, but as printed *verbatim* from the surgeon-general's own writing. This induced us to investigate, and we find that some mistake has been made which will probably call for explanation from the *Register* in its next issue. We learn that Surgeon-General Sternberg did not write the opinions and recommendations credited to him, and that he had yet to see the report reputed as having been sent by General Otis. We may therefore conclude that matters are not in such a desperate condition as represented in the paragraph, which possibly had its origin in the misapprehensions of some earnest but inaccurate promoter of a bill advocating governmental employment for dental surgeons.

FRAUD IN MEDICAL EXAMINATIONS.

So commonplace does bribery seem to have become in some communities, that level-headed men will be prepared for the charges of fraud that have been made in some states in connection with examinations for license to practice medicine. From time to time it has been reported that various devices to cheat have been employed in these examinations, such as prompting, the use of notes, and the like, on the part of individuals, and such expedients will no doubt continue in use until the whole world has been made perfect; but certain preliminary conditions are necessary in order that such wholesale and premeditated fraud may be connived at, as it is said was actually done at recent examinations before a state medical examining board. Having apparently learned from their representatives in municipal, state and national legislatures, and from other public officials, that the road to success and preferment must be paved with deception, bribery, ballot-stuffing, convention-packing, and broken promises, a number of applicants for the license to practise medicine conceived the brilliant thought that it would lighten the labors not only of the small number of examiners, but also of the larger body of applicants to be examined, if the questions to be put were placed in the hands of so many of the applicants as were willing to join in the enterprise, just a little before the time set for the examination. All that was necessary was to find some obliging person who, for a consideration, would secure the questions from a public-spirited, patriotic, and loyal state printer, with an eye single to the welfare of the commonwealth and the nation. The necessary arrangements were made, the price agreed on, and in due time notice was sent to those who had promised to make good the outlay, when it was found that copies of the questions could be obtained for a smaller expenditure. In this way trouble arose, and finally the secret came out. It has been stated, further, that not dissimilar methods have been employed in ex-

aminations in some medical schools for the doctorate, or in hospitals for resident physicianships, an obliging clerk either securing the questions in advance or substituting for the original paper of answers prepared in the examining room and handed in, a much more perfect paper prepared at the convenience of the student. There is not much to add. The remedy suggests itself. It might have been hoped, however, that even embryo medical men were less free from the vices of the times than other men, and in spite of revelations such as those cited, there is still good reason to believe that the hope is justified.

"ENDORSED BY PHYSICIANS."

When a patent medicine vendor desires to make a specially strong claim for his stuff, he adds to all its other advantages that it has the endorsement of physicians. If by hook or crook a man who can write "M.D." after his name can be cajoled or bribed to sign a testimonial in favor of a patent nostrum, that testimonial will be kept on duty until the paper fades and the ink has lost its blackness. There are various ways in which to get these endorsements, the most business-like being to buy them outright, provided it does not cost too much. But there is another and better scheme than this. It is to get the doctors to use the nostrum for a while; get them to prescribe and endorse it by writing it up in the medical journals and by talking about it in medical societies. To do this takes time, energy, and no small amount of tact in advertising. The nostrum vendor must give the doctors a present occasionally, such as a pocket-book with an imitation dollar in it; a case containing an assortment of the nostrum to carry in their vest pocket—so they won't forget it—etc., and then he must supply them with an attractive sign to hang on the office wall. This is an especially good thing to do if the sign is ornamental and suggestive. Of course, it must contain the name of the nostrum in plain letters so that all the patients can see it easily. A calendar is a good thing, as it will last for a year and yet will change every month. In this way the promoter of the nostrum keeps on the good side of the doctor and can then work him to work the people. It is a great scheme, because money can be made from the start. After the doctors have been used long enough to make the necessary impression on the people, the latter can be handled direct through the newspapers. This method has been used many times in the past, as it is being used now, and will be so long as physicians are such willing tools. These agreeable reflections are called forth through the kindness of a friend who has sent us a clipping from a newspaper called *The Mirror*. The article is entitled "Mr. Ingalls and Women," although it is difficult to understand just what Ex-Senator Ingalls has to do with the subject, unless it be that he, like the doctors, is used as a tool with which to pull the chestnuts out of the fire. Here is the "meat" of the article, which of course is a paid advertisement, without further comment:

Maybe, as a rule, women headache and backache and legache more than men, but I declare to goodness! I never heard of one bellyaching more than the men. And so, not altogether cheerfully, I must yet admit that, in a thousand ways, women are more open to attack than men. Against a host of pains. Nature gave them less armor, while man's civilization increases their need of it. But I thank the Lord, that, even as civiliza-

tion has increased our pains, lo! many times and manifold, so hath Science given us relief from our suffering. For, perhaps the greatest boon to our race (the blessings of which, men equally -hure) comes to us under a name of two Greek words, "Anti" and "Kamnos," which, Anglicized as Antikamnia, mean "opposed to pain." This has been the sheet anchor of joy in a million homes where pain would dwell. It has harmlessly relieved the untold sufferings of countless mothers and daughters. In opposing and dispelling our pains, it is most democratic (which is not a characteristic of Mr. Ingalls). It cares not whether the cause be a "cold," la grippe, rheumatism or neuralgia—whether it be toothache or stomachache, headache or "that pain in the side"—making no difference whether our sufferings be due to man's inhumanity to woman or Nature's regular periods of distress. It discriminates not in favor of the rich or powerful, neither does it depress the overburdened heart—duchess or nurse, bookkeeper or bluestocking, servant or society queen, it's all the same to Antikamnia Tablets—they relieve them all and plant on the pinched face of pain the roses of health and joy.

And right here let me say, parenthetically, for the benefit of my sex (and before I proceed further to demolish Senator John James Ingalls of Kansas), that Antikamnia is put up in the form of five-grain tablets and that the usual dose for adults is from one to two tablets every two to four hours, according to the need. My doctor tells me that physicians prescribe them all over the world, because, unlike opium, narcotics and so many other drugs—gracious me, I can't remember half their names!—Antikamnia Tablets never produce habit, never incapacitate, are always prompt and efficient, have no balloon characteristics, lifting one up among the clouds in "iridescent dreams" only to drop one in the slough of despond. They just relieve the suffering, drive away the pain and leave the nerves as steady as you please, mind you, and Oh! so rested!"

Medical News.

THE COUNTY hospital at Colorado Springs, Colo., was destroyed by fire January 20. The loss is estimated at \$8000.

THE HEALTH Board of Pine Bluff, Ark., has requested the mayor to issue a proclamation making vaccination compulsory on the part of all citizens.

AT A meeting of the city council of Huntsville, Ala., an ordinance was passed requiring the vaccination of all children attending the public schools.

DR. YVES KERRIEN, superintendent of the insane asylum at Vanvres-Malakoff, with four attendants, is on trial in a Paris court, for cruelty to inmates. Dr. Socquet, sent to investigate, testified to finding many traces of violence on the bodies of the patients.

THE GERMAN lay press has translated President Keen's editorial on the Gallinger bill, from THE JOURNAL of Dec. 23, 1899. The *Kölnische Zeitung* of January 11 publishes it in full, under the heading: "A Call to Arms Against Antivivisectionists," with a few words of explanation and approbation.

THE PARIS dailies mention that the physicians who have been gratuitously devoting their time, for years, to two large dispensaries for children in Paris, connected with the *Ecoles de Terne*, recently resigned *en masse* in consequence of an order from the officers of the society that they must henceforth refuse to treat children who are attending the "free schools."

THE QUESTION of the admission of medical women to membership in the Berlin Medical Society has been finally decided. The resolution, supported by Virchow and others, and adopted by an overwhelming majority, provided that any physician *approbrite* for the German Empire is eligible to membership. This opens the doors

to women whenever they succeed in obtaining the official sanction of the German Empire, and not until then.

WE HAVE mentioned the utilization of carrier pigeons by physicians to obtain prompt news of their patients and a summons when needed, but a French confrère, Dr. Kaplan of Janville, Eure-et-Loir, has surpassed them by training pigeons to take back replies to the patients. The *Gazette Méd. de Paris* of January 13 illustrated the "medical pigeon house" and promises, soon, a full description of the methods of training pigeons to accomplish what it calls "these truly elegant and even marvelous results."

A BILL now pending in the Ohio legislature provides for the examination of all desiring to practice medicine in the state. It establishes an examining board which would be simply a continuation of the present board of registration vested with additional powers. The Board will refuse to accept diplomas as qualifications, and if the applicant fails to pass the examination he can not practice. The law has been asked for by a joint committee representing all the schools of medicine in the state.

A POSSIBLE danger of the public bath is illustrated in the report of a number of cases of conjunctivitis of varying degrees of severity, occurring among those known to have frequented a given bathhouse in Berlin. With a reasonable degree of cleanliness, and the observance of ordinary precautions, such an unpleasant occurrence should be avoidable, but the fact that it has been observed should be sufficient, not only to awaken those concerned in the management of such admirable institutions to its possibility, but also to suggest the measures necessary for its prevention.

PRACTICE ON DIPLOMA-MILL DEGREES.—The Michigan Board of Medical Registration has, on the opinion of the attorney-general, decided to throw out diplomas from diploma-mills that sell their degrees without requiring residence or study. This disqualifies a large number of the dupes of Armstrong, Bland & Co. These have flocked into Michigan of late years, and probably not all of them have yet come before the Board, but this decision will settle their status. It is a pity that some neighboring states do not have the Michigan law against diploma-mills; as it is, she has to protect herself against their products. The same question is at present before the Wisconsin Board, and is likely to require settlement by the courts. It is to be hoped that the law in both states will be found sufficiently iron-clad to resist the attacks that are likely to be made against its execution.

SMALLPOX PREVALENT.—The official reports to the U. S. Marine-Hospital Service, Dec. 29, 1899, to Jan. 26, 1900, show the general prevalence of smallpox throughout the country. The greater number of cases are reported from the Southern States. The following is a brief summary of reported cases: Georgia—Brunswick, 10; Blackshear, 16; Waycross, 7; Louisiana—Lafayette, 130; East Feliciana, 50; Shreveport, 51; New Orleans, 32; North Carolina—Halifax County, 50; Guilford County, 23; Rowan County, 16; Ohio—Cincinnati, 5; Cleveland, 48; Oklahoma Territory, 54; Tennessee—Memphis, 132; Columbia, 24; Nashville, 8; Mount Pleasant, 8; Texas—Austin, 10; Houston, 5; Index, 30; balance throughout the state, 31. Press dispatches state that the disease is rapidly increasing in Indiana, and has made its appearance in twenty counties. The chief difficulty lies in the fact that many physicians dispute the diagnosis. Dr. J. N. Hurty, secretary of the

State Board of Health, has issued an order requiring local boards to enforce the rules of the State Board without question. In event of failure to comply with its orders the secretary is empowered to institute legal proceedings against the refractory officials. Twenty cases are unofficially reported from Vicksburg, Miss.

NEW YORK.

New York City.

DR. J. RIDDLE GOFFE has been elected chairman, and Dr. George G. Ward, secretary, of the Section on Obstetrics and Gynecology of the New York Academy of Medicine.

WHILE a woman was engaged in spraying the throat of her child, aged nearly 3 years, suffering from diphtheria, the nozzle of the spray apparatus became loosened and lodged in the child's throat. The boy choked to death before a physician could reach him.

THE WIDOW of a wealthy brewer has made a number of charitable bequests: \$2000 for the Home for Incurables, \$3000 for the German Hospital, \$1000 for the founding of a training-school in connection with this hospital, and \$1000 each to St. Joseph's Home for Consumptives and the Lebanon Hospital.

AT THE twentieth annual dinner of the New York alumni of Cornell University, held January 26, the president of the University made announcement of an anonymous gift to Cornell of \$80,000, for a building to be erected at Ithaca, for the study of anatomy and physiology. The toast, "Cornell in Greater New York," was responded to by Dr. Wm. M. Polk, dean of the Cornell Medical School in New York City.

CASE OF SMALLPOX.

A laborer who had been employed in North Carolina on a railroad, came to New York on the Old Dominion Line and, two days later, walked into Bellevue Hospital complaining of feeling sick. The physicians who saw him, it is said, told him that the proper hospital for him was the Metropolitan, but he could not be sent there until the following day. Not recognizing the true nature of his disease, they allowed him to leave the institution. The day was spent in riding about in street-cars, and at night he sought shelter in the City Lodging House. A few hours later he was so ill that he was sent to Bellevue Hospital, and then the correct diagnosis of smallpox was made. The man was promptly isolated, and the Board of Health notified. The lodging house was thoroughly disinfected, and the ninety-five lodgers were vaccinated.

PENNSYLVANIA.

THE ANNEX to the St. Joseph's Hospital, Lancaster, was opened January 26. The hospital is under the Order of the Sisters of St. Francis.

THE AUTHORITIES are still after offenders against the oleomargarin law. On January 20, seven grocers were arrested at Chester and given a hearing. All have been held in \$300 bail.

AT THE Pennsylvania Epileptic Hospital and Colony Farm, in Chester County, forty epileptics are being cared for, while twice that number have been treated during the past year. Many applicants are rejected on account of lack of facilities.

Philadelphia.

THE CITY Board of Health is perfecting arrangements in regard to ventilation of street-cars.

TO DATE \$1700 has been subscribed to the fund for the benefit of the widows and families of British soldiers who have lost their lives in the South African War.

DR. J. MADISON TAYLOR has sent out notices calling attention to the need for a pay hospital for contagious diseases in this city such as exist in Boston, New York, and other cities.

OPIMUM SMOKING.

A YOUNG woman teacher of the Chinese became addicted to the smoking of opium, which it is believed she learned from her pupils. Having gone to an opium den and smoked, she developed alarming symptoms before medical aid was obtained, and death occurred shortly afterward. Smoking of opium appears to be by no means uncommon, not only among the Chinese but among others. Opium is consigned to Chinese merchants, and by them sold to the habitués, while, it is charged, policemen have been most negligent.

THE REPORT of the Philadelphia Society for Organizing Char-

ity, for the past year, shows that fewer applications were made to the Society than during any of the previous five years. There were 22,077 applications for aid. Among these, 1243 non-residents of the city were cared for, of whom 345 were furnished with transportation. Notwithstanding that the state appropriation of \$2500, asked for, was not made, the receipts amounted to \$30,580.34, and at the end of the year \$91.87 remained on hand.

THE COMMITTEE on Hygiene, of the Board of Education, proposes to give more attention to the subject of hygiene in the public schools, by proper instructions to janitors, on whom rests more responsibility than has been accredited them.

UNIVERSITY OF PENNSYLVANIA MEDICAL SOCIETY.

This society was organized January 26, for the promotion of medical and allied sciences, particularly among those officially connected with the University. It is hoped to enlist the active co-operation of all attached to the medical, biological, dental, and veterinary departments, the University Hospital, the Veterinary Hospital, the Laboratory of Hygiene, and the Wistar Institute of Anatomy and Biology. The following officers were elected: president, Dr. A. C. Abbott; vice-presidents, Drs. Milton B. Hartzell and Leonard Pearson; and secretary, Dr. A. O. J. Kelly.

OHIO.

THE SCHOOLS at North Amherst have been closed on account of an epidemic of scarlet fever and diphtheria. Twenty cases have been reported.

THE TRUSTEES of the Massillon State Hospital have asked the legislature for an appropriation of \$170,000 for improvement of the institution. Of this sum \$55,000 is desired for the construction of an assembly hall and the remainder for additional cottages and an infirmary.

Cincinnati.

A NEW chemical machine for disinfecting alleys and gutters has been tried by the Health Department, with marked success.

DR. C. C. AGIN, who has just recovered from an attack of appendicitis, has left for Cuba, to recuperate, in company with Dr. W. D. Haines.

SUIT AGAINST DRUGGIST.

A RATHER novel suit for damages was filed January 23, against a druggist. The defendant says that in December, 1898, she was suffering from extreme nervousness and sent her husband to the drug store for a medicine that would relieve or cure her. The druggist recommended and sold to her husband a proprietary medicine, and prescribed, as a dose for her, a teaspoonful three times a day until she was relieved or cured. She says that she took the medicine as directed until Feb. 15, 1899, when she became paralyzed and unconscious. She claims that she was seriously ill for ten weeks, and unable to attend to her work for six months, and that as a result her general health has been greatly impaired. She wants \$5300 as damages either for the prescribing of the wrong or too much of the right medicine.

Columbus.

BOARDS OF HEALTH.

The tenth annual meeting of the state and local boards of health was held in this city January 25 and 26. Dr. Frank W. Hendley, of Cincinnati, a member of the state legislature, explained a bill which has just been introduced by him in the House, providing for the immediate disinfection of any school room in which, during a period of thirty days, five cases of any infectious disease have been present. He also spoke of another bill which he is preparing, providing for a state hospital for cattle infected with tuberculosis, and asking for suggestions on this point. Drs. Tenny, Probst, and Deuschle were appointed a committee to confer with Representative Hendley regarding his bill for disinfecting school rooms. Dr. Probst, secretary of the State Board of Health, recommended that the legislature be urged to enact laws corresponding to the standing orders and regulations of the boards of health. A motion was introduced to oppose the appointment of a commission by the Government appointing health officers in cities of over 3000 inhabitants, but, after considerable discussion, a new motion was offered and adopted to let the present mode of appointment remain as it is, and another in favor of appointing county health officers. Dr. W. A. R. Tenney, of Cincinnati, read the outline of a

bill providing for the sterilization of barbers' tools, which he asked to have referred to the same committee that was to confer with Dr. Hendley. The Nominating Committee reported the following nominations, which are equivalent to election: president, W. S. Hay, Weelston; vice-president, Mrs. Mary E. Moore, of Youngstown, and H. S. Prophet, of Lima; secretary, H. H. Cassel, Portsmouth.

ILLINOIS.

THE ANNUAL report of the Aurora City Hospital shows that 214 patients were treated in the institution during the past year.

THE QUARTERLY report of the State Board of Charities shows that the total number of inmates of state institutions at the end of the quarter was 10,197. The average cost per capita for their support was \$39.06.

Chicago.

DR. CHRISTIAN FENGER has left the city on a vacation. He will return March 1.

DR. NICHOLAS SENN has returned from his hunting trip in Texas.

THE MEDICAL inspectors of schools examined 7376 pupils during the week, of which number 452 were excluded.

DRS. W. T. MONTGOMERY and D. W. GRAHAM sailed for Europe January 30. They will spend six months and visit the principal Mediterranean ports.

THE WILL of the late Dr. Albert E. Hoadley, filed for probate January 26, disposes of an estate valued at \$50,000.

MORTALITY STATISTICS.

The total mortality for the past week was 486, a reduction of 55 as compared with the week preceding. The reduction was chiefly in the chronic diseases and among the aged. There was a slight decrease of mortality from scarlet fever and diphtheria. The rate for typhoid fever also shows a decline.

DEATH UNDER "CHRISTIAN SCIENCE."

Another victim was added to the "Christian Science" mortality, January 26. An 8-year-old child was placed under the cure of a "healer" who diagnosed the case as "bronchial croup" and applied the usual methods of prayer. During the course of treatment, which extended over two weeks, it was observed that respiration was greatly impaired and that there was some obstruction in the throat, but an examination was not considered necessary by the "healer." When the child finally succumbed, he is said to have stated that the immediate cause of death was "heart disease." The coroner's physician found that the child died of "strangulation, caused by the breaking of an abscess in the throat." It is not known whether legal proceedings will be instituted against the "healer."

PHYSICIANS' CLUB.

A regular meeting of the Physicians' Club was held January 29, with the following program: "Constitutional Aspects of Medical Legislation," Hon. S. P. Shope; "Analysis of the Present Medical Law, Its Strength and Weakness," J. W. Pettit; "Need of Organization to Promote Proper Medical Legislation," George H. Simmons; "Practical Difficulties in the Way of Passing Medical Practice Acts," J. A. Egan. Remarks were made by Drs. I. N. Love, of St. Louis, C. W. Hawley, Frances Dickinson and H. N. Moyer. A resolution was passed recommending George W. Webster for the first vacancy occurring in the State Board of Health.

MARYLAND.

REGULATION OF PRACTICE.

A committee of the Medical and Chirurgical Faculty, consisting of Drs. Samuel T. Earle, Jr., C. Hampson Jones, William Osler, William F. Lockwood, and Thomas A. Ashley of Baltimore, and J. McPherson Scott of Hagerstown, have framed a new law, changing and strengthening the existing legislation relating to the practice of medicine in Maryland. The committee visited Annapolis on the 25th ult., to bring the proposed measure before the legislature. The first law for the regulation of the practice of medicine in Maryland was that of 1799—the charter law of the Medical and Chirurgical Faculty. In 1839 the legislature changed this, and in 1892 the present law restored to the Society its lost powers in regulating practice; the 1892 law was amended in 1894 and in 1896.

Baltimore.

DR. JESSE W. LAZEAR, assistant in clinical microscopy, Johns Hopkins Medical School, recently appointed assistant-surgeon U. S. A., left for Havana, February 1. He will there be connected with the newly-equipped laboratory.

DR. THOMAS WOOD HASTINGS, formerly assistant resident physician of Johns Hopkins Hospital, has charge of the nurses and medical outfit in the American hospital-ship *Maine*, in the English service in South Africa.

DR. H. A. KELLY, while exhibiting some snakes at the meeting of the Johns Hopkins Medical Society, January 22, was bitten by a diamond-backed rattlesnake, on the end of a finger. Jerking his hand away quickly, he merely sucked the finger, and proceeded with his demonstration. No ill-results ensued, as he drew away his hand so quickly that the snake had not time to inject its venom into the wound after it had struck.

"ST. AGNES SANATORIUM."

St. Agnes Hospital, which is under the charge of the Sisters of Charity (R.C.), will be changed from a general hospital to one for treatment of nervous diseases exclusively. No insane will be admitted. Dr. George J. Preston has been made medical director. This is the first institution of the kind in the state, and there has been a growing need for it for many years. The late Dr. John P. VanVibber was on the point of establishing one, having had a successful dispensary in operation for some years, when his health broke down, followed by his untimely death. The institution has seventy acres of ground, part woodland, with greenhouses, flower and fruit gardens and grassy lawns, and over 125 private rooms, with two free wards supported by the city appropriations. A hydrotherapeutic establishment costing \$40,000 was recently added.

DISTRICT OF COLUMBIA.

HEALTH OF THE DISTRICT.

The report of the health officer for the week ended January 20 shows the total number of deaths to be 106, of which number 64 were white and 42 colored. There were 2 fatal cases of diphtheria, 1 of scarlet fever, and 1 of typhoid fever. At the close of the week there were 67 cases of diphtheria, over 100 of scarlet fever, and 3 of smallpox under treatment.

Washington.

THE SUM of \$5000 has been added to the urgent deficiency bill for the completion of the isolated wards of Providence Hospital.

THE FOLLOWING physicians have been appointed by the Board of Trade on the Committee of Public Health: Dr. W. W. Johnston, Surgeon-General George M. Sternberg, Drs. H. L. E. Johnson, W. P. C. Hazen, L. W. Richie, J. E. Jones, G. H. Henderson, C. W. Richardson, I. S. Stone, H. H. Barker, J. W. Boveé, D. P. Hickling, F. T. Chamberlain, W. C. Woodward, and C. R. Dufour.

As a result of the competitive examination recently held, Dr. Ferdinand Walsh was appointed assistant resident physician, Dr. W. C. Williams was promoted to be resident, and Dr. Charles G. Smith was made assistant resident, at the Central Dispensary and Emergency Hospital. Dr. W. E. Whitson has completed his service as resident physician and retires to enter private practice.

DENTISTS FOR THE ARMY.

The bill recently introduced in Congress authorizing the appointment of dental surgeons with the rank of major for each regiment is strongly opposed by Adjutant-General Corbin and Surgeon-General Sternberg. While the latter advocates the appointment of dental surgeons for the army, where required in the interest of the soldiers, he does not approve of their being commissioned officers with the rank of major. He calls attention to the fact that regular surgeons in the army have to serve about twenty years, and sometimes longer, before they reach the rank of major, and he does not think it would be fair to admit dental surgeons in the army with the rank at the outset. He favors the employment of contract dental surgeons.

LOUISIANA.

New Orleans.

THE CIVIL district court has refused to grant the mandamus asked for by the City Board of Health (see THE JOURNAL, January 27, p. 244) to compel the city council to increase its appropriation for the current year.

SMALLPOX, which has been quite prevalent for some time, numbers among its victims two members of the graduating class of the medical department of Tulane University. Twelve others are being cared for in the museum, which has been turned into a comfortable ward for them.

At a meeting of the Board of Control of the leper hospital, January 22, it was announced that the appropriation of \$20,000 for a permanent leper home was available. A commission will be immediately appointed to select a site.

NEBRASKA.

STATE MEDICAL LEAGUE.

The annual meeting of the Nebraska State Medical League was held in Lincoln, January 24. The work of the League during the past year was discussed and future plans were formulated. This organization was formed last year, for the purpose of uniting the profession in the state for furtherance of medical legislation, enforcement of medical law, and raising the standard of medical education. The League is made up of registered physicians of all schools. A vast amount of work has been done, and the League is steadily gaining in membership. The next meeting will be held in connection with the meeting of the State Medical Society, in June.

CANADA.

DR. SINCLAIR, Paris, Ont., has been appointed chief physician to the Blind Institute, Brantford, in place of Dr. Marquis, recently deceased.

DR. COTTON has given notice of a bill in the Quebec legislature, now in session, concerning the medical profession in that province. It is understood to apply to the election of officers of the College of Physicians and Surgeons. Proxies are to be abolished, and practitioners will hereafter vote in their own districts, instead of in Montreal.

OVER-CROWDING IN ONTARIO ASYLUMS.

It is stated that the number of inmates of the various asylums in this province is increasing, at present there being over 4500 lunatics undergoing treatment. Include those feeble-minded people at the Orillia Asylum and the number will reach 5200, an increase of over 100 during the past year. During the last ten years there has been an annual increase of something like 88.8, and, as a consequence, all the provincial asylums are full, and in many places these unfortunates are housed and cared for in the common jails. Although there is an annual increase of the insane population, the per capita ratio of lunatics of the population remains practically the same. The provincial legislature is about to assemble, and provision must be made to accommodate the increasing number of those who require treatment in our asylums. At present there are practically no vacancies in any of them, and the lunatics confined in jails on Dec. 31, 1899, numbered 89. It is very probable that the government will ask, at the coming session, for a large appropriation to turn the old Victoria College at Cobourg into an asylum for epileptics and very mild cases of lunacy. To meet the increase, alterations are proceeding in several of the asylums. There are at present over 700 inmates in the Toronto Asylum, as compared with 643 in 1898. The new asylum in Brockville is already filled, with 600 patients.

COUNTY MEDICAL HEALTH OFFICERS FOR ONTARIO.

That the above is likely soon to become a question of practical politics in Ontario may be gathered from the interest the provincial lay press is devoting to the subject. Lately there has been a rather extensive outbreak of smallpox in North Essex; and the county paper of that district says that had there been a competent county medical officer with power to act promptly, much could have been accomplished in the way of prevention of the spread of the disease. At present physicians are appointed by the municipalities in the respective counties, whereas, if each county had a properly constituted officer, devoting his whole time and attention to the work in hand, it would be done thoroughly and fearlessly, without any dread of offending certain individuals and corporations. It is stated that in the recent outbreak of smallpox in Essex, the ordinary physicians had no desire to look after those afflicted with the disease, and in all probability it was due in a large measure to this diffidence that something like 250 cases of the disease occurred in that county. For some time the secretary of the

Provincial Board of Health, Dr. Bryce, has advocated the appointment of these county officials, and as the matter was up for discussion at the last session of the legislature, it is altogether probable that a fuller and freer consideration of the whole subject will be gone into on the part of the representatives of the people.

BIG DECREASE IN ONTARIO'S BIRTH-RATE.

Dr. Bryce, the deputy registrar-general of Ontario, has prepared the following statement, based on figures now being prepared for the report of the registrar-general: Over a period of ten years, in an urban population estimated (1891) at 407,058, and during which the yearly census has shown an increase of 25.6 per cent., there has been an absolute decrease of births in the thirteen chief cities of Ontario, from 10,819 in 1889 to 9111 in 1898, or a difference of 1708. These cities are: Toronto, Hamilton, Ottawa, London, Kingston, Brantford, St. Thomas, Guelph, St. Catharines, Belleville, Stratford, Windsor, and Chatham. Had the rate of increase of registration from 1889 to 1898 been the same as that in the population for the same period, there would have been registered, in 1898, 12,709 births instead of 10,819. Toronto is cited as an illustration of the defective system of registration. During the ten years there has been no change in the incumbency of the office of registrar; and the population has increased by 47,065, though the births show an absolute decrease of 824; or there were 20 per cent. more births registered in 1889 than in 1898. If, however, the population, according to the municipal returns, be taken into the calculation, viz.: an increase from 139,452 in 1889 to 186,517 in 1898, then had the rate in 1889 been maintained, there would have been 6,615 births registered in 1898. In other words, a relative decrease of 64 per cent. has occurred in the birth-rate of Toronto during the last ten years. This then is the state of affairs only three years after the provincial legislature passed the act of 1896 which provides that division registrars shall use all available means to obtain the necessary information in regard to such births, and shall receive 20 cents for each return, to be paid by the municipality, and that the parent, nurse, midwife, or physician in attendance should give notice thereof to the division registrar within thirty days from such birth. It seems obvious that some other machinery than that at present employed in cities is absolutely necessary if complete returns are to be expected.

CHARLOTTETOWN HOSPITAL.

The report of this hospital, for 1899, shows that 185 patients were received during the year. Of this number 100 were paying patients. Besides these there were 46 outside patients, to whom medicine was dispensed gratis during the year. There were 60 surgical operations and 4 deaths; 13 discharges in the hospital at the end of the year. This hospital is the largest in P. E. I.

DR. W. G. NICHOL, Montreal, has been appointed acting medical examiner for the Royal Arcanum, a secret society of Quebec.

It has been proposed that the medical department appoint a bacteriologist, who may be employed by the milk dealers to make bacteriologic examinations of milk.

DR. W. W. CHIPMAN, of Edinburgh, has been appointed assistant gynecologist to the Royal Victoria Hospital. He is at present assistant to Professor Simpson and to Dr. Barbour.

M'GILL MEDICAL SCHOOL.

Friends of this institution are especially grateful for the recent gift of \$100,000 to be devoted to building new laboratories for the departments of chemistry, anatomy, pathology, and physiology. The registration in this school for the current year is 451, the entering class numbering 132. A number of McGill graduates are serving the government in the Transvaal. A new course has been opened, that in hygiene and public health, under the special supervision of Prof. Wyatt Johnson. At present no university on this continent is giving such a course, the one started some years ago by the University of Pennsylvania having been giving up for lack of attendance. The number taking the course this year is limited to members of the medical faculty, who will help in the organization of the work. Next year the course will be presented especially for post-graduates who are interested in the work of health boards, public medicine, etc.

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COVERED.

A PRELIMINARY INVESTIGATION OF THE THEORY OF THE INOCULATION OF MALARIAL FEVER THROUGH THE AGENCY OF MOSQUITOES.

BY ALBERT WOLDERT, M.D.
PHILADELPHIA.

(Concluded from Page 269.)

For some time past I have been studying the different species of mosquitoes collected in eastern and central Texas, eastern Pennsylvania, and the eastern coast of New Jersey. I learned that during the month of October the *Culex pungens* was the most common species which prevailed to the greatest extent in all of them. I have made sections of many of them and examined these microscopically. Probably 2000 sections have been made. The subject of entomology is a very important one in connection with this work, and in this department of science there is much room for improvement, such as the classification of mosquitoes.

NATURAL ORDER OF THE MOSQUITO.

The mosquito belongs to the natural order *Diptera*, sub-order *Nemocera*, and to the family *Culicidæ*. Two genera are most commonly known, namely, *Culex* and *Anopheles*. The word "mosquito" is derived from the Spanish and Portuguese *mosca* or the Latin *musca*, which means a gnat or fly. The name probably originated in the West Indies, where it is learned that the term "culex, mosquito" was first applied to a kind of gnat streaked with silvery white, the female members of which have a piercing and sucking proboscis and annoy man.

Mosquitoes are distinguished from *Chironomus*, which they resemble very much, from the fact that the former are provided with an elongated proboscis or biting apparatus, while in the *Chironomus* the proboscis is but poorly developed. The wing of the mosquito is covered with hair-like scales that often extend beyond the posterior margin. The *Chironomus* is often seen in swarms or clouds, which give rise to the impression that there is a deluge of mosquitoes in a certain locality. Some members of the family *Simuliidæ* are also called mosquitoes. All told, about 150 species of mosquitoes have been described. The natural food of this insect is probably the juice of plants, the sucking of blood being an *acquired taste*. They only forage for food

within a short range of their natural habitat. How long the adult insect can live under the most favorable circumstances is not known. One writer says that the impregnated female may survive the winter, feeding in sheltered spots, such as barns, cellars and outhouses.

It is stated by authors on this subject that the eggs of the mosquito are deposited by the female in a delicate boat-shaped mass on the surface of the water. These are packed side by side with the smaller end uppermost, forming a concave mass that floats readily. They hatch within a few days, and within a period of from three to four weeks develop into the full-grown insect. Several broods are hatched each season, about 300 eggs being deposited. Frequently—but not always—the female dies after depositing the eggs. When the egg cell ruptures, the larval stage begins, and in the case of the *Culex pungens* or common mosquito the body of the larva becomes partly submerged and floats with head downward, but breathes through the pneumatic tube at the extremity of the tail. To these bodies the term "wigglers" or "wrigglers" is applied. The eggs of the *Culex pungens* may be deposited in buckets or pails around the house, and in stagnant water. This variety may be termed a "house mosquito." Not all mosquito larvæ are deposited in stagnant water, for the soil may also harbor them. It is said that this insect is found in the Rocky Mountains, where stagnant water is unknown. The male probably never bites man, owing to the non-development of the mouth parts. He may be readily distinguished from the female from the fact that the former is provided with antennæ which are broadly feathered—bearded—or plumose, while in the latter the antennæ are slender and only have a few lateral bristles. (see Fig. 1.) It has been stated that the male "rarely enters our dwellings and lives unnoticed in the woods," but I must dissent from this view.

GENUS ANOPHELES DISTINGUISHED FROM GENUS CULEX.

According to Ross, the larvæ of *Anopheles*, unlike those of *Culex*, do not swim with head downward, but lie flat on the surface, like sticks, due to absence of a breathing tube. The larvæ of *Anopheles* are not found in buckets of stagnant water around the house, in wells, cisterns, and drains, or in artificial collections of water, but are only found in *natural* ponds or puddles, such as persist after heavy rains. They have been found in puddles between rocks, in rice-fields and between the rows of growing grain. Fish devour the larvæ with avidity, hence they are seldom found in lakes or ponds where fish are present. The *Anopheles* is a distinctly rural mosquito. In searching for the adults, Ross usually found them around stables and cattle byres. The adult *Anopheles* may be distinguished from the *Culex* in that the former has spotted wings, the palpi are as long as the proboscis, and when the insect rests against the wall the body projects outward, while in the *Culex* the body hangs downward. In the *Anopheles* that I have seen, the legs are quite long and very much finer than in the *Culex*, and are not striped. It has been said that certain species of *Culex* have spotted wings. I can not speak for all species of the latter, but the following named species do not have spotted wings as the term implies in the case of the genus *Anopheles*: *Culex triseriatus*, *Culex impiger*, *Culex pungens*, *Culex stimulans*, *Culex posticus*, *Culex teniorhynchus*, *Culex fasciatus*, *Culex perturbans*. The following species of *Culex* have whitish transverse bands across the legs: *Culex teniorhynchus*, *Culex stimulans*, *Culex fasciatus* and *Culex excitans*.



PLATE 1. *CULISETA INORNATA*



PLATE 2. *CULISETA INORNATA*



PLATE 3. *CULISETA INORNATA*



PLATE 4. *CULISETA INORNATA*



PLATE 5. DISSECTED MOSQUITO



PLATE 6. *CULISETA INORNATA*

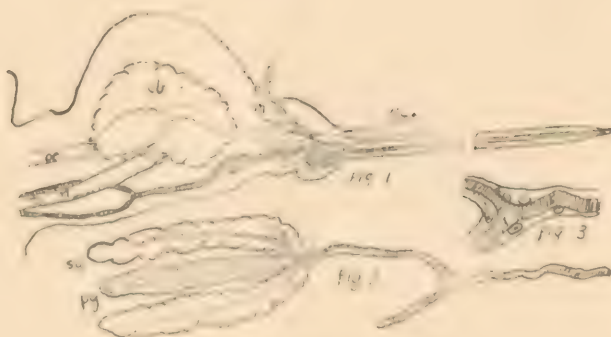


PLATE 7. *CULISETA INORNATA*



PLATE 8. *CULISETA INORNATA*



PLATE 9. PART OF PLATE 8



PLATE 10. *CULISETA INORNATA*



PLATE 11. PORTION OF ABDOMEN AND STOMACH OF MOSQUITO



PLATE 12. STOMACH OF MOSQUITO

INOCULATION OF MALARIAL FEVER THROUGH THE AGENCY OF MOSQUITOS.--WOLDERT.

JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

TABLE OF GENERA OF CULICIDAE (WILLISTON).

1. Proboscis short, not longer than the head; metatarsi longer than the following joint: genus *Corethra*. Proboscis much elongated, longer than the head and thorax together: See No. 2 of this classification.
2. Proboscis strongly curved, palpi of the male very long, of the female very short: genus *Megarhinus*. Proboscis straight: See No. 3 of this classification.
3. Palpi in both sexes, of equal length: See No. 4 of this classification.
- Palpi in the male long, short in the female: genus *Culex*.
4. Palpi longer than the antennæ: genus *Anopheles*. Palpi shorter than the antennæ: genus *Aedes*.

CHARACTERISTICS OF THE COMMON SPECIES OF MOSQUITOES.*

The most common species of mosquito found in the United States is the *Culex pungens*. It was the one found prevailing during October in the different sections of Texas, Pennsylvania and New Jersey, previously named. In my collection only one *Anopheles* has been caught. It was sent from central Texas—near the Brazos River—where a severe form of malarial fever was then prevailing. It belonged to the species *punctipennis* and was devoid of blood. Sections were made of it.

The following description may be made in regard to the *Culex pungens* or common—domestic—mosquito: This is of medium size, rather dark-brown body, with yellowish pubescens or fine hairs on the thorax; the legs are dark reddish, quite long; the proboscis slightly curved; and the abdomen very dark-brownish, with margins of segments whitish. The dorsal surface of the abdomen contains several circular, light or yellowish bands. The palpi in both male and female are rudimentary. (See Plates Nos. 1-3.)

Another common species of *Culex* is the *Culex triseriatus*. It is found mostly along the coast country, and is especially severe in New Jersey. It is of medium size; the body brownish in color, and on each side of the abdomen or tergum are seen several whitish triangular spots at the base of each segment; on each side of the thorax—pleura—two spots of whitish hairs are seen; the legs are very black in color.

Culex fasciatus is another common species. On macroscopic appearance it might be termed a "black mosquito." The legs are striped transversely, with whitish bands. It is of medium size, about the same as the *pipiens* of Europe. Across the proboscis three whitish bands are seen. The thorax is very black and contains a row of white spots along the dorsal line. It is found mostly in the tropics and along the coast country. Besides the above-named species, the following are also common: *Culex Consobrinus*, *Culex impiger*, *Culex stimulans* and *Culex teniorhynchus*. The *Psorophora ciliata* and *Megarhina rutila* are perhaps the largest mosquitoes.

GENERAL CHARACTERISTICS OF ANOPHELES.

I can only speak of *Anopheles quadrimaculatus* and *Anopheles punctipennis*. The three most distinguishing characteristics of these two species are: Presence of dark or brownish spots on the wings, due to a thicker growth of fine hairs in these regions; palpi as long as the proboscis; legs very long, delicate and of a solid dark-brown color. The body in both species is of a light brown color. According to Loew (1863) the *Anopheles claviger*—or *maculipennis*—occurs in North America. It must be rare. Mr. C. W. Johnson, curator of the Wagner Free Insti-

tute of Science, Philadelphia, has not been able to collect a single specimen. There is no specimen of this species at the Academy of Natural Sciences of Philadelphia, American Museum of Natural History of New York, and none obtained in North America in the collection of the National Museum at Washington. I have looked up the original reference of Loew^a. In an address before the Society of Koenigsburg Naturalists, delivered in 1861, he said: "The comparison of the North American diptera with the European ones was rendered possible to me on a very extended scale through the study of the conclusions of Baron Osten Sacken. The comparison showed a surprisingly large number of species common to both continents. As such species common to both countries, I can name with certainty and from personal investigation the following: *Anopheles claviger* (Meigen); *Anopheles quadrimaculatus* (Say), or, according to Loew, termed *Anopheles pictus*; *Anopheles nigripes* (Staeg, etc.)."

The most common species of *Anopheles* found in North America are: *Anopheles quadrimaculatus* and *Anopheles punctipennis*. The *Anopheles quadrimaculatus* has been found in eight different localities of the United States, as follows: Texas, Florida, Maryland, District of Columbia, Illinois, Minnesota, New Hampshire and New York. The *Anopheles punctipennis* has been found in nine different sections of the United States, to-wit: Texas, District of Columbia, Maryland, Vermont, Massachusetts, Pennsylvania, New York, New Mexico and Illinois. Besides the above, the *Anopheles crucidus* and *Anopheles ferruginosus* have also been found in this country.

THE ANOPHELES QUADRIMACULATUS.

Plate 4 may be thus described: Body about the size or perhaps a little more slender than *Culex pungens*; body and wings dark brownish in color; four maculated brownish or dark spots on each wing, due to a thicker growth of short bristles or hairs in these areas. Three of these spots are found extending along one of the veins near the costal vein, while one is somewhat posterior to the last two spots (see Plate 4); legs very long and slender and of a solid dark-brown color somewhat lighter at the tip of the femora and tibia.

The *Anopheles punctipennis* is about the same size as the *quadrimaculatus*, but of a somewhat lighter brownish color than that of the latter. This species also has several dark or brownish spots on each wing, but these are differently distributed from those seen in the *quadrimaculatus*. In the *A. punctipennis* two of the spots are distributed along the costal vein, while there are several smaller spots irregularly placed posterior to these two larger ones; the legs are about the same length, size and color as in the latter species.

Mr. C. W. Johnson informs me that while on a collecting trip along the St. Johns River, Florida, he was severely bitten one night by the *Anopheles quadrimaculatus*. On his return to Philadelphia, two weeks later, malarial fever developed.

The *Anopheles claviger*, from the imperfect descriptions that have been given, seems to present the same general characteristics of the *quadrimaculatus* and *punctipennis*, but the dark or brownish spots on the wings are said to be four in number and distributed along the anterior nervure.

PERSONAL COLLECTION OF MOSQUITOES.

The following data regarding my collection of mos-

*Plates Nos. 2 and 3.

^a Stillman's Journal of Science, vol. xxxvii, No. 37, p. 317, new series.

quitoes may be detailed: All that were caught in sleeping apartments, outhouses and cellars in Philadelphia during the last two weeks of September and October were the *Culex pungens*. The females predominated probably in the ratio of six of that sex to one male. Toward the latter part of October the males seemed to be more numerous. Mosquitoes caught under the bar of patients in eastern Texas, suffering from malarial fever, in the latter part of September, showed two males and five females; six were *Culex pungens* and one *Culex triseriatus*. Mosquitoes caught in east Texas, along a small ravine, at about the same date, showed ten females and two males, all being *Culex pungens*. Another lot gathered in the same territory, from wells, sleeping rooms, barns and outhouses, were all *Culex pungens*. Another collection gathered about one mile distant from this locality, but this time from the edge of an artificial lake fed by a spring, were of the same species. Specimens from central Texas, collected during the first week of October, exhibited nine mosquitoes; seven were female *pungens* and two male *fasciatus*. Another collection from the same locality, collected about the end of October, showed about twenty female *Culex pungens*, half a dozen males; and in addition about twenty specimens of *chironomus*. In this collection there was one female *Anopheles punctipennis*, which was devoid of blood. Many of the culex were filled with blood. Two mosquitoes, caught in southern Texas, from a sleeping apartment—first week of November—proved to be one male *fasciatus* and one female *pungens*. About one dozen specimens of mosquitoes from the eastern coast of New Jersey collected in the last week of October all proved to be female *Culex pungens*. Some of the latter were caught in the cellar of an old barn located about one hundred yards from a fresh water pond which never dries up; while the others were caught about one-eighth of a mile distant and on a bar hung in a sleeping room.

TO KEEP MOSQUITOES ALIVE.

In order to study the sporozooids—germinal threads—of the malarial parasite in the tissues of the mosquito it is essential that the insect should be kept alive for a number of days after the blood has been taken into its stomach. Creagh has stated that they thrive well on a mixture of equal parts of brown sugar and dry sherry wine, which should be renewed every two or three days. Bancroft has recommended that a banana—with rind partly removed—be suspended near them and renewed every four or five days. Following Bancroft's recommendation I placed a mosquito in a wide mouth bottle and covered it over with a thin gauze. In the bottle, about every two or three days was placed a small slice of banana, and the gauze was daily sprinkled with water. The mosquito died on the fifteenth day. Of another collection treated similarly one lived from October 28 to December 16 (or 50 days): while another one of the same collection lived until December 26 (or 60 days). The insect may frequently be seen to attack the fruit immediately upon its introduction.

THE MOUTH PARTS OF THE MOSQUITO.*

The proboscis, beak or oral armature, consists of an epipharynx—or labrum—two mandibles for piercing tissues, two maxillæ—or jaws—and a hypopharynx. These mouth parts, when not in use, are enclosed within a scale-covered sheath called the labrum. When placed together the mouth parts form a tube through which the insect sucks its food. Morphologically in man the epipharynx corresponds to the hard palate—pharynx—while the hypopharynx corresponds to the tongue, or

floor of the mouth. The hypopharynx was so named by Savigny in 1816. Evidently it is an error to speak of the mosquito as “stinging” a person.

The mastax is a term applied to any masticating portion of the alimentary tract posterior to the mouth. The mosquito *Culex pungens* seems to be provided with such an organ. At least an aperture is seen forming the roof of the dilated portion of the esophagus below the pharynx (see Plate 8, Fig. 5), with radiating lines from the inner surfaces. This aperture is lined with yellow chitin, as is the outer integument—exoskeleton—of the mosquito and other surfaces derived from the ectodermal layer.

The pharynx (Plate 5, Fig. 3) in the mosquito is located near the under surface of the insect's head, and in the median line. It has an oblong or oval shape, slightly yellowish in color and lined with chitin.

The esophagus of the mosquito (see Plate 5, Fig. 9), soon after it is given off from the pharynx, dilates into a kind of pouch and then passes downward into the dilated portion of the alimentary tract, lying within the thorax. Below this point it forms a sinuous canal until the widely dilated pouch is formed lying within the abdomen (so-called stomach). The lumen of the esophagus, after entering the abdomen, has a star shape and contains granular material (Plate 10, Fig. 3).

THE VENOMO-SALIVARY GLAND.*

It seems probable that the venomo- or veneno-salivary gland in the mosquito varies somewhat in shape according to the different genera, although my experience in this matter is not sufficient to make an absolute statement, and such is subject to correction.

The venomo-salivary glands are two in number, one on each side of the insect's neck in the antero-inferior portion of the prothorax.

Prof. G. Macloskie of Princeton University was probably the first to accurately describe this gland of the mosquito. If there be previous writers, their work has not fallen into my hands. Macloskie's specimen (see Plate 7) was dissected by Dumas Watkins, in 1888. It is thus described by the former writer: “Working backwards from the hypopharynx I found that the duct is not readily identified with a low-power microscope. It has the usual chitinous lining surrounded by the nucleated hypodermis. It is distinguished from the trachea by the comparative smallness and constancy of its diameter, and by the absence of ramifications. It runs back in the lower part of the head beneath the nerve commissure for two-fifths of a millimeter. In the throat it bifurcates into two branches, being each as long as the individual segment, and running on the right and left of the nerve cord into the prothorax, where they terminate in glands of a characteristic structure.

“The glands are in two sets, one on each side of the insect's neck in the antero-inferior region of the prothorax. Each set consists of three glands resembling in structure, but not proportionately so long as the single salivary gland on each side of the prothorax of the house fly. The third gland, that occupying the center of each set, is different, being evenly granular, and staining more deeply than the others. Its function is without doubt the secretion of the poison. Each gland is about one-third of a millimeter long and one twenty-fifth of a millimeter broad. The three are arranged like the leaves of a trefoil and each is traversed throughout by a fine ductule, the three ductlets uniting to form a common duct, which is like a pedicle of the trefoil and is one of the branches of the bifurcated venomo-salivary

*Plates Nos. 3, 5.

Plates 7 and 8.

duct. Thus there are six glands, three on each side, two of them poisonous and four salivary, their secretion diluting the poison. I see muscles apparently inserted in the framework of this reservoir (Plate 7 *m*); but Dimmock seems to think that the hypopharynx is not furnished with muscles. However this may be, the pressure exerted on it by the surrounding parts when the mosquito inserts its piercing apparatus into the flesh or through the epidermis of a plant, being sufficient to propel the poison through the tubular axis of the hypopharynx into the wound, the reservoir must be furnished with a valve to prevent the reflux of the secretion. The poison is diluted by the secretion of the salivary lobes and the two efferent ducts, one from each set of glands, carry forward and commingle the venomo-salivary products in the main duct, and the stream is thus carried by the main duct to the reservoir at the base of the hypopharynx [tongue]." These observations were made on the *teniorhynchus* and a species of the allied genus *Anopheles*.

In my stained section (Plate 8, Fig. 7, and Plate 9, Fig. 3), it will be observed that the venomo-salivary glands of the *Culex pungens* have a different shape from that described by Macloskie, who worked with another species and another genus of mosquito. In his specimen the gland is described as being of a trefoil shape, while in Plates 8 and 9 the gland would appear to be pear-shaped, somewhat constricted in the middle. There appears not to be three lobes on each side of the insect's neck, but only one. The capsule of the gland takes a deep blue stain and contains scattered oval or round and dark nuclei. Within each gland the mucous spaces appear so arranged that the fluid is discharged into a depression in the center, and thence onward through ducts, one from each gland, they unite in front of the esophagus to form the main duct, which communicates with the mouth parts (hypopharynx). In certain areas the mucous spaces appear slightly granular, but are generally clear or glistening in aspect. Below the lobe of each gland, on either side of the esophagus, are seen (Plates 8 and 9) certain round glandular cells (gizzard) having a capsule similar to that of the salivary glands and with similar mucous spaces. They are seemingly joined to the outer wall of the esophagus, but I have been unable to trace any communication between them and the esophagus. Whether the shape or structure of the venomo-salivary gland in this insect could have any influence in storing up spores of micro-organisms I do not know. Reaumur, in the last century, believed that the function of the fluid from the venomo-salivary glands was to coagulate proteids and to promote the process of suction. It is known that the bite of the mosquito does not give rise to hemorrhage.

THE CROP.*

In dissecting the mosquito, especially in the area adjacent to the upper portion of the prothorax or pleura, there frequently comes into view a clear and glistening object composed of a delicate membrane containing air bubbles inspired during the brief interval preceding its death. Following up this body it is found to be attached to an enlarged portion of the esophagus in the thorax. This is the crop, an organ which acts as a reservoir for food. Before its relative position is disturbed, this pouch may sometimes be observed lying partly in the celom or abdominal cavity, and compressed against the anterior wall of the abdomen. In certain instances, on being drawn outward a rhythmic movement may be

observed, probably due to the insertion of a small and oval-shaped muscle inserted in the neighborhood of its union with the esophagus. In one dissection this movement of the muscle was observed (low power lens), even after all the surrounding tissues including the head and neck had been removed. With each contraction of this small oval muscle a wavy undulation would be communicated to the esophagus. At intervals of about every ten or fifteen seconds the crop would contract visibly and the outer end would draw upward toward its attachment to the esophagus; finally this pouch began to make a series of quick jerks which lasted a considerable period. On detaching the esophagus the muscle still contracted, and on being dissected out was found to be attached to the tissues lying in the neighborhood of the venomo-salivary glands.

THE STOMACH OF THE MOSQUITO.*

The stomach of an insect is a term applied to a dilated glandular portion of the alimentary canal usually lying within the thorax. That which has been described as the stomach of the mosquito lies wholly within the abdomen. The esophagus, soon after it passes a point corresponding to the metanotum, begins to undergo a gradual dilatation into an oblong pouch forming the stomach. As in the case of the esophagus, the stomach is held in position by four strands of connective tissue extending from the outer surfaces in four directions and running outward through the fatty tissue toward the abdominal wall (Plate 10, Fig. 3). When the stomach is distended with blood, it occupies the whole abdominal area, and the outer abdominal wall, together with a very small amount of fatty tissue, alone remains as a protection. In this condition the Malpighian tubes are pressed downward in the median line, where they are observed to lie in bundles. In one of my sections, made through the central abdominal region—and through the stomach—the blood was found to be coagulated in a thick layer around the inner surface of the stomach, and remained a deep brownish color, while in the central cavity the degenerated products—hemoglobin, etc.—of the red cells were seen, many of which contained dark granules. In this area a few red corpuscles appeared to be normal and stained a faint bluish tint. This picture doubtless represents the products of digestion in this insect.

HISTOLOGIC APPEARANCE OF MOSQUITO'S STOMACH.*

Manson describes the histologic appearance of the stomach of the mosquito as follows: 1, an outer layer composed of ramifications of air vesicles of this insect; 2, two layers of muscular fibers, one longitudinal and the other circular; these cross each other at right angles, producing a sort of rectangular pattern; 3, beneath this a sort of structureless membrane, the mucous coat, which does not stain well—epithelial layer composed of several strata of cells.

The following description applies to the stained section (Plate 11, Fig. 2, and Plate 12) here presented: 1, an outer wall composed of a thin tunic of connective tissue containing a few deeply stained nuclei; 2, two rows of muscle cells with round nuclei; 3, a single layer of columnar epithelial cells with elliptic or rod-shaped nuclei; 4, an inner mucous (chitin) coat which does not stain well. In the third layer there appears to be more than a single layer of columnar epithelial cells, which is probably due to the folds or rugæ of the stomach.

THE MALPIGHIAN TUBES.*

The Malpighian tubes of the mosquito—*Culex pun-*

*Plate 5, Fig. 8.

*Plates 11 and 12. *Plate 5, Fig. 11.

gens—are, according to my dissections, five in number. They have their origin in that portion of the stomach which joins the small intestine, and after being given off from this portion of the alimentary canal, curl upward, outward and then downward, forming various loops which are closely woven together, and finally terminate below in the region of the small intestine, in small canals the distal ends of which are closed. The Malpighian tubes were formerly regarded as hepatic or liver tubules, but Lowne thinks they go to form a hepato-pancreas. By modern writers (Conklin and others) they are considered excretory organs—kidney tubules. In some instances their proximal extremity has a dark appearance due to the contained material. On cross section each tube is made up of an outer or connective tissue layer containing round, large and deeply staining nuclei, and an inner basement membrane which surrounds large cells—drain-pipe cells.

THE CIRCULATORY AND RESPIRATORY SYSTEMS OF THE MOSQUITO.

Insects have no system of arteries or veins, nor closed system of blood-vessels, and the blood flows freely among all the tissues. The circulatory system of insects is of a very primitive character, consisting of a dorsal vein open at both ends and divided into a variable number of cavities. It is situated on the dorsal surface, and in the median line of the thorax and abdomen. The dorsal vein performs the function of the heart in higher forms of life. With each pulsation of the dorsal vein, which begins at the posterior end, the blood is propelled forward into the head, and after passing backward freely among the muscles and other tissues, finally enters the body cavity—celom—and appendages. Within the abdomen the oxygenated blood circulates in close relationship with the air tubes, and in this way it becomes oxygenated while CO₂ is eliminated. No doubt there are smaller vessels by which the blood is again returned to the dorsal vein. The blood of the mosquito is colorless. I have not learned whether the circulatory system is the same in all varieties of mosquitoes, and do not know why the sporozooids of malarial fever should become stored up in one species of mosquito and not in another species.

The respiratory system of the mosquito consists for the most part of stigmata—tracheæ, spiracles or breathing tubes—the two larger of which pass downward from the mouth parts on either side of the anterior surface of the neck (Plate 5, Fig. 4), and probably have their external opening in the pleura or thorax (the forebody consisting of prothorax, mesothorax and metathorax). Ramifications of the air tubes are given off in all directions in the thorax. Spiracles are also present in the abdomen, and pass upward and communicate with the external air by oval shaped orifices, protected by muscles, placed beneath the dorsal segments or tergites.

The eggs of the mosquito are comparatively large in size, and of a round shape. They are generally found in masses and are held in position by a thin membrane almost transparent in color. They stain a deep purple with Delafield's hematoxylin solution. In certain instances karyokinetic figures were observed.

THE CELOM OR BODY CAVITY.*

The celom or body cavity of the mosquito is comparatively large. It extends from the upper limit of the esophagus above to the point where the Malpighian tubes have their origin in the lower portion of the stomach. Within the abdominal area it probably has no definite shape, depending on the amount of distention

of the stomach. It is walled off from the fatty tissue about its edges by a thin but seemingly elastic membrane, from which strands of connective tissue radiate inward to become attached to the stomach. When the stomach is empty it appears to be suspended near the center of this cavity by means of these strands, and the tissue from the periphery presses inward, thus in part obliterating the celom. Within the thorax the celom is quite large. Plate 8, Fig. 8 represents a somewhat longitudinal section of the tissues about the celom.

NERVOUS SYSTEM OF INSECTS.

It has been said that insects have no true brain as the meaning implies in the case of man. Plate No. 6 (see plate) evidently shows that the mosquito possesses a cerebrum and cerebellum. Some insects seem devoid of sensation. For the most part the nervous system is made up of ganglia, the largest collection lying within the head parts. From the cephalic ganglia or brain is given off a double nerve-cord extending the entire length of the insect. From the ganglia or different segments, nerve-fibers are given off in all directions. In the higher insects the thoracic ganglia are well developed and control the vital functions.

METHOD OF DISSECTING A MOSQUITO.

There are no guides on this subject. The routine method which I followed in many dissections may be thus described: Only the fresh specimen was used. The apparatus and instruments consisted of a Zeiss dissecting microscope; a pair of forceps with extra-fine points; two extra-fine needles placed in wooden handles; normal salt solution; killing fluid, such as absolute alcohol, chloroform or hot 50 per cent. alcohol. It was found best to leave the head and neck attached to the body throughout the dissection. Several hours were consumed in each dissection. The mosquito, after being killed, was placed on the glass stage of the dissecting microscope, and a few drops of normal saline solution added, after which the wings and legs were removed close to the insect's body. To dissect out the venom-salivary gland see Macloskie's directions. A high-power lens should be used in this region. My dissections of these glands have not been entirely satisfactory. To find the esophagus, crop, stomach and Malpighian tubes is a comparatively easy task, patience only being required. Dissections should be made from above downward.

In removing the pharynx (Plate 5, Fig. 3) an incision was made in the median line of the head, cutting downward and from time to time adding normal saline solution in order to render the field clear. In searching for the crop and esophagus, the insect was caught by the remnants of the femora and the dissection was begun by laying open the upper portion of the prothorax on the dorsal surface, carrying the teasing process downward in the median line. Each individual fragment of tissue was removed, care being exercised not to exert too much force in its removal. From time to time normal saline solution was added to make the field clear of fatty particles, with which the insect was abundantly supplied. Working along the dorsal surface to a sufficient depth, a few strokes were made on the anterior surface of the thorax, when the clear and glistening crop would come into view, being recognized by its oblong or pear shape, glistening color and contained air bubbles. Following up its duct the esophagus was easily reached, being recognized by its tubular appearance, brownish color and elasticity. The esophagus was then followed downward, cutting through the scutellum. (Here some patience was required in order to prevent the head and

*Plates 8, 9 and 11.

thorax from becoming detached. As a precaution it was found best to keep the abdomen pushed well up toward the thorax so that overstretching would be prevented.) The abdominal wall was then nipped in a number of places, exercising care so as not to injure the Malpighian tubes, when the fatty whitish particles would escape in large quantity.

To remove the stomach and Malpighian tubes, the esophagus was followed downward by cutting through the abdominal wall and gently teasing the fragments away. From time to time, if the two outer edges of the abdominal wall were placed on the stretch, the stomach and Malpighian tubes could be recognized, the former by its oblong shape, the latter by their loops. Normal saline solution was frequently added, and by gentle teasing all the fatty particles were removed, leaving the other part enclosed within its somewhat elastic abdominal wall. To get a complete dissection, usually three mosquitoes were necessary; one for the pharynx, one for the esophagus, crop and stomach, and one for the Malpighian tubes and rectum.

Ross imbeds in celloidin. These sections were imbedded in paraffin, cut with a Minot microtome, and stained with Delafield's hematoxylin solution.

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NOTE.—After this paper had been compiled an interesting article by W. N. Berkeley appeared in the *New York Medical Record* for December 23, 1899, entitled "An Account of Some Personal Work on the Mosquito-Malaria Theory with Remarks upon the Present Status of the Investigation."

BIBLIOGRAPHY.

In the preparation of Part I of this article (see JOURNAL) I have kept close to the words of Ross, Manson, Grassl and others, as printed in the *British Medical Journal* and *London Lancet*, and various abstracts of medical journals in this country, more especially to the article of W. B. James in the *N. Y. Medical Journal* for June 24, 1899. I regret that I am not more familiar with the extensive work of Koch in regard to this question. Some knowledge of the proper nomenclature of the younger forms of the sporozoa has been derived from the article by T. B. Fletcher in the *Am. Jour. of The Med. Sci.*, September, 1899.

For Part II, a large list of books on entomology was consulted; but for the most part the article consists of original work, there being no guides on this subject. All the plates are from original drawings, except that of Macloskie.

NOTE.—Without the many courtesies extended me by Prof. E. G. Conklin of the Biologic Department of the University of Pennsylvania, this work could not have been done. My sincere thanks are also tendered to Mr. C. W. Johnson, curator of the Wagner Free Institute of Science, for his aid in classifying the mosquitoes and for correcting part of the manuscript. To the following named I am also under many obligations for favors shown: Drs. Alfred Stengel, T. C. Ely, W. L. Pyle, and A. O. J. Kelly, of Philadelphia; W. J. Condon, of New Jersey, and J. H. Sears, R. E. B. Bledsoe and Mr. J. W. Smiley, of Texas.

EXPLANATION OF PLATES

Plate 1: Fig. 1, palpi. Fig. 2, proboscis. Fig. 3, antennae. Fig. 4, thorax. Fig. 5, tibia. Fig. 6, abdomen. Fig. 7, foot claw. Fig. 8, front tarsus. Fig. 9, femora. Fig. 10, hind tarsus.

Plate 2: Fig. 1, proboscis. Fig. 2, antennae. Fig. 3, palpi. Fig. 4: Fig. 1, palpi. Fig. 2, costa, or costal vein. Fig. 3, proboscis. Fig. 4, antennae. Fig. 5, first longitudinal vein.

Plate 5: Fig. 1, labium. Fig. 2, mandible. Fig. 3, pharynx. Fig. 4, spiracle. Fig. 5, venomo-salivary gland. Fig. 6, maxilla. Fig. 7, duct of venomo-salivary gland. Fig. 8, crop. Fig. 9, esophagus at a point corresponding to the scutellum or projecting hard part of the thorax (the metanotum is the space just below the scutellum, which separates the thorax and abdomen). Fig. 10, stomach. Fig. 11, Malpighian tubes. Fig. 12, small intestine. Fig. 13, colon. Fig. 14, rectum.

Plate 6: Fig. 1, simple eye of mosquito. Fig. 2, compound eye. Fig. 3, central portion of cephalic ganglia or cerebrum of mosquito. Fig. 4, ganglion cells. Fig. 5, cerebellum.

Plate 7: Anatomy of venomo-salivary gland and surrounding parts. Macloskie's dissection (*American Naturalist*, October, 1888). Fig. 1, *du*, venomo-salivary duct with its insertion in *hy*—hypopharynx; *cb*, cerebrum—below this is the cerebellum and the pumping enlargement of *oe*, esophagus; *tr*, base of labrum-epipharynx; *m*, muscle; *n*, nerve commissure—other parts removed. Fig. 2 is the venomo-salivary duct showing its bifurcation, and the three glands on one of its branches; *py*, poisonous gland; *sg*, upper of the two salivary glands. Fig. 3 is the bifurcation of the duct, with its

Plate 8: Fig. 1, longitudinal section through base of labium. Fig. 2, section through palpi. Fig. 3, roof of pharynx. Fig. 4, part of cephalic ganglia. Fig. 5, mastax. Fig. 6, longitudinal section

through upper portion of esophagus. Fig. 7, venomo-salivary gland. Fig. 8, celom or body cavity anterior to esophagus. Fig. 9, glandular cells, probably gizzard. Fig. 10, longitudinal section through dorsal coat of esophagus. Fig. 11, series of dorsal coat of thorax.

Plate 9: Part of Plate 8, greatly magnified. Fig. 1, duct of venomo-salivary gland. Fig. 2, longitudinal section through esophagus. Fig. 3, venomo-salivary gland. Fig. 4, glandular bodies—gizzard (?). Fig. 5, celom or body cavity.

Plate 10: Fig. 1, adipose tissue. Fig. 2, dorsal vein. Fig. 3, esophagus. Fig. 4, celom.

Plate 11: Fig. 1, dorsal vein. Fig. 2, transverse section through so-called stomach, showing arrangement of columnar epithelial cells with elliptic nuclei: owing to the folds of stomach it appears that more than a single row of these cells are present. Fig. 3, celom. Fig. 4, adipose tissue.

Plate 12: Part of Plate 11, greatly magnified: in this section the double row of muscle cells is near the periphery, and toward the cavity of stomach the columnar epithelial cells are depicted. Fig. 1, nuclei of muscle cell. Fig. 2, elliptic nuclei of columnar epithelial cells. Fig. 3, longitudinal section through a loop of a Malpighian tubule showing large round nuclei. The lumen of the tubule is also shown.

Philosophia for June 7-1899.
Dear Sir: I would be very glad if you would kindly
send the following specimen in brand copy of article
entitled "Malaria and Malaria" in Journal
of the American Medical Association, sent you.
Page 341, Plate 8, Figure 8, lower the following words:
"celom or abdominal cavity anterior to esophagus"
and insert "longitudinal section through selected portion
of abdominal tract within the thorax." The same
I enclose from covering. Yours truly,
Will you send journal for 1899, may copy
1706 N. 16th St.

crease slowly. The aqueous became so turbid and deposits on the lens so dense that no careful examination of the fundus could be made after the first day; numerous peripheral synechiæ developed, and the vision, within a week, was reduced to fingers at 5 to 6 feet. Then as the eye was steadily getting worse, the injections were stopped and 150 grains of salicylate given every day for three days. After this there was no change for nearly a week, whereupon the salicylate was renewed, 150 grains being given on four or five days in each week with hot applications. An improvement now set in and continued steadily until, on April 12, vision equalled 18/200. The salicylate was now stopped for several days and less atropin used, but the inflammation got decidedly worse, improving again when the salicylate was recommenced. On April 22 the vision was 20/50, and continued to improve under the same treatment until, on June 6, 1896, it was + 20/20 with the refraction corrected; and this vision has been maintained up to the present time without any relapse of the inflammation. As the inflammation decreased, the number of days in the week on which the large doses of salicylate were given was decreased; but 150 grains were taken on at least one day in each week for several weeks after the last signs of active inflammation had disappeared. On May 4, 1896, when this patient's vitreous had cleared up sufficiently to allow the fundus to be seen, a patch of retinochoroidal exudate with a small retinal hemorrhage could be seen at the nasal side of the nerve, with some new vessels in the retina, the nerve being blurred at its inner margin. Near the equator, down and out, there were a number of small, roundish, well-defined foci of choroidal atrophy, with slight rings of pigment; and other round whitish areas appearing like exudate in the retina. As the case progressed the exudate near the nerve cleared up entirely, leaving only the roundish patches of choroidal atrophy and some slight deposits on the anterior capsule to indicate the great danger through which the eye had passed.

CASE 2.—A. S., a boy of 17 years, on April 6, 1896, while trying to capture a wounded sand-hill crane, was pecked in the right eye. When seen by me on the evening of the next day, there was a large wound of the inner limbus, filled with shreds of iris and choroid, with the anterior chamber filled with blood. The chemosis was so extreme that the wound could not be examined well, and as there were strong indications of beginning panophthalmitis, the eye was simply cleansed and bandaged. The next day, under chloroform, the shreds of iris and choroid were cleared away, the bandage was renewed and full doses of salicylate were given. The improvement was quite rapid, the chemosis disappearing, the congestion lessening and the blood in the anterior chamber clearing up; so by April 22 it could be seen that the iris was nearly or completely missing; vision then being 10/200; vitreous opacities preventing a clear view of the fundus. A day or two after this he went out, got wet and caught cold. At this the eye became very much worse, the vision decreasing to fingers at six inches; with increased congestion and turbid aqueous. On April 30 the vision of the left eye, which had not been previously tested, was found to be 20/30, a little minus, and there was a very faint redness of the conjunctiva or episcleral tissue. This congestion was not a deep ciliary congestion, and as the eye was objectively normal in every other respect I unfortunately waited until the next day, when the patient for the first time noticed that his vision was a little cloudy, though

the test showed the same vision as the day before; but the diffused congestion was more pronounced and a strong glass showed fine deposits on the anterior surface of the lens—not on Descemet's membrane—the nerve was perhaps a little hyperemic, but nothing decidedly abnormal could be seen in the fundus. The boy said that the night before he had severe headache. The right eye was now enucleated, and atropin and full doses of salicylate given. The membrane in the center of the pupillary space thickened, so that on May 4 the vision was only 6/200. There was considerable pain at night in the front and back of the head. May 6, 150 grains of salicylate a day having been given, the congestion was somewhat less, but soon after it became worse and the pupil slowly got smaller in spite of atropin and hot applications. This increase in the inflammation continued until about May 16, the vision being reduced to counting fingers at 1 to 2 feet. For a day or two before this the ordinary hot applications had made the eye feel worse, so flaxseed poultices were used, changed every few minutes for an hour at a time three times a day. At the same time the dose of salicylate was increased to 180 grains in the twenty-four hours. This produced a prompt and decided improvement, which continued steadily until May 28 when, after going without the salicylate for three days, taking pilocarpin sweats instead, the eye became painful and congestion again increased, whereupon the large dose of salicylate was used again on three or four days in each week and the inflammation gradually decreased until, on June 17, the eye was free from inflammation externally, vision was 8/200, a large opacity in the vitreous preventing a view of the fundus. He left the hospital in July, with the eye quiet and vision 20/70, the vitreous being still quite turbid. He has had no return of the inflammation, but when seen again after nearly a year, it was found that the lens had become quite opaque and the vision was reduced to counting fingers at 6 to 8 feet. He was last seen on April 18, 1899, when the opacity of the lens was found to have increased slightly, but he could still find his way about readily; the pupil was about 6 mm. in diameter, its edges firmly adherent to the lens. An attempted iridectomy removed only the anterior layers of the segment of iris seized. It is quite possible that he may still have his vision considerably improved.

CASE 3.—Mrs. E. E., aged 59, came to me May 13, 1898, with immature cataracts. The right lens was needled slightly, this being followed by considerable swelling of the lens, the upper part of the iris being pushed forward so that when the lens was extracted, the incision button-holed the iris, leaving fragments which were hard to remove completely from the angles of the wound. A very small one of these healed in at the inner angle, but when she left the city, on June 17, with vision 20/50, this seemed to be entirely covered with conjunctival epithelium, and did not project at all above the surface; the neighboring sclera, however, was slightly congested. A month later, with more accurate correction, her vision was 20/30—with the operated eye. She returned Dec. 28, 1898, stating that the right eye had been a little inflamed for a few weeks after she reached home, but since then had given her no trouble, except now and then to feel as though something were in it. About the 1st of September she got much heated and exhausted crossing a rough field and, within a few weeks thereafter, noticed that the sight of the right eye was getting poor; this was followed by decrease in the sight of the left eye, which at the time of her visit to me

Societies.

Perry County Medical Society.—This Society met at Duncannon, Pa., January 25, and elected the following officers: president, L. M. Shumaker; vice-president, H. D. Reutter; secretary, A. R. Johnston; treasurer, D. B. Milliken.

Ramsey County Medical Society.—The annual session and election of officers was held by this Society, in St. Paul, Minn., January 29. The new officers are: president, G. A. Renz; vice-president, Cornelius Williams; secretary, E. F. Geer; treasurer, Fred Leavitt.

St. Joseph County Medical Society.—The fourteenth annual meeting of this Society was held in South Bend, Ind., January 30. Among others presenting papers were E. W. Andrews, Weller Van Hook, and G. Frank Lydston of Chicago, and L. H. Dunning and F. C. Ferguson, of Indianapolis, Ind.

Denver and Arapahoe Medical Society.—The following named physicians were elected officers of this Society, at its annual meeting, January 9, held in Denver, Colo.: president, C. K. Fleming; vice-president, H. G. Wetherill; treasurer, E. J. Rothwell; financial secretary, G. H. Stover; secretary, C. P. Conroy.

Thirteenth International Medical Congress.—The Secretary-General of the Congress gives notice of the following reductions in rates: 1. All the railway companies of France will grant to the members of the Congress a reduction of 50 per cent. on round trip tickets, as follows: Every member will receive, on application to the Secretary-General, Dr. A. Chauffard, 21, Rue de l'Ecole de Médecine, Paris, a ticket which must be stamped at the railroad station where he enters France, on paying the full price of a single trip to Paris. At Paris the member will have this ticket *visé* in the office of the Congress, and it will then serve as a return ticket without additional expense. The journey to Paris having been paid entirely, and the return trip being free, there is a 50 per cent. reduction. It goes without saying that in order to secure this, the return trip must be to the same point at which the original fare was paid. 2. The French line—La Compagnie Generale Transatlantique—will allow members of the Congress a reduction of 10 per cent. on tickets from New York City. 3. The Secretary-General has arranged to provide to early applicants a number of lodgings, including light and service, at the rate of five francs a day; and various agencies also advertise reduced rates for lodgings. For further particulars and application blanks for membership, address, Dr. H. B. Jacobs, Secretary, American National Committee, 3 W. Franklin Street, Baltimore, Md.

New York County Medical Association.

Jan. 15, 1900.

DR. THOMAS H. MANLEY presented a case of secondary osteoplasty, a specimen of gangrenous perforation of the sigmoid flexure, and a specimen of very large omental hernia.

DR. F. H. WIGGIN presented a large fibroid uterus, just removed by the intraperitoneal method.

NEW METHOD OF RETROPERITONEAL DRAINAGE OF PYOSALPINX.

DR. LEON F. GARRIGUES read the first paper of the evening, on this title. It included a report of five cases so treated, but the histories were not read. The author is of the opinion that pelvic suppuration should be treated by vaginal drainage, not only because this procedure is almost free from risk, but because convalescence is so very much more rapid after it than where laparotomy has been performed. In addition to the disadvantage of longer convalescence, which oftentimes extends over many months, there is the danger of ventral hernia. He has seen severe hemorrhage follow puncture of the abscess and packing with iodoform gauze, and besides such packing is painful, and by reason of the pressure to which it is subjected, does not drain efficiently.

The technique which he advises for these cases is as follows: An incision is made at the anterior vaginal junction, commencing posterior to a transverse line drawn through the cervical canal on the side corresponding to the pyosalpinx, and following the contour of the cervix for a distance of three-quarters

of an inch, passing through the whole thickness of the vaginal wall. With the forefinger, the peritoneum can usually be quite readily stripped off from the uterus, and this should be done until the origin of the Fallopian tube is reached. Having located the most prominent part of the pus tube, an assistant presses downward while the operator pushes a pair of blunt scissors into the pyosalpinx. Having explored the abscess cavity with the finger, and broken down any pockets, a T-shaped rubber drain is inserted. He does not approve of irrigating the cavity at the operation, lest there might be a minute opening present through which infected matter might gain entrance to the peritoneal cavity. Four out of the five cases were operated on in tenement houses, and all five made complete recoveries.

DR. J. RIDDLE GOFFE said that while he is an earnest advocate of the vaginal route for the treatment of pelvic disease, he does not approve of the method advocated by Dr. Garrigues, though he has never personally tested it, nor had an opportunity of listening to a detailed report of the cases presented; but on theoretic grounds he objects to opening up the broad ligament in these cases. This ligament is bountifully supplied with lymphatics, and the danger of infection by so doing seems too great. Another objection is that it does not seem to be capable of effecting a radical cure. The method which he prefers and practices, consists in freely opening Douglas' pouch and making a thorough exploration. He then brings down the uterus and its appendages through an anterior vaginal incision. Where the abscess is large, it is necessary to first puncture and drain.

DR. J. E. JANVRIN also favors the posterior incision and drainage through the cul-de-sac—a method which is not liable to excite peritonitis, and which will, in the majority of cases, effect a cure. Because of the danger of infection in Dr. Garrigues' method, he considers it fully as dangerous as the more usual one of incising the posterior cul-de-sac. From personal observation, he vouches for the good results attainable by Dr. Goffe's method.

DR. H. J. BOLDT said he finds it difficult to understand how the method described in the paper could be employed for cases in which the pyosalpinx is high up in the pelvis, or where there is only a slight enlargement of the tube. He prefers to open the posterior cul-de-sac widely enough to admit his hand. In this way he can satisfy himself that he is really dealing with the tube, and that there are no other pus collections in the pelvis.

DR. GARRIGUES replied that the fact that in all his cases the temperature promptly fell to normal is a sufficient proof that the theoretic danger of infection has been exaggerated. In his own hands this technique has yielded a radical cure. As he has only employed it where the tubes were but slightly enlarged, he could not fully answer one of Dr. Boldt's criticisms.

MANAGEMENT OF HERNIA.

DRS. PARKER SYMS, John F. Erdmann, Henry Roth, Irving Haynes, and William B. Coley presented papers on various phases of strangulated hernia, which appear in THE JOURNAL.

DR. WILLIAM B. DEGARMO spoke of the negligence of many medical practitioners in regard to the proper application of trusses. This was a matter requiring the physician's personal attention. Where a light truss will efficiently support a hernia, no other treatment is required; on the other hand, where it occasionally allows the hernia to escape, or the patient is careless about the use of the truss, operation is demanded. He believes that the operation for radical cure should be done in almost every case of strangulated hernia, and after the patient has worn a bandage for four or five weeks, it is his custom to dismiss him, so great is his confidence in the radical cure. While all surgeons recognize the danger of resorting to taxis, the fact remains that many practitioners continue to employ it before giving their consent to operation. They will succeed more often in reducing the hernia if they will attempt to draw down the hernia farther instead of attempting to push it back.

DR. CHARLES N. DOWD, in the discussion, called attention to the fact that the operation for the relief of a strangulated hernia can be safely done at the extremes of life. He recently operated on a strangulated femoral hernia in a very feeble man of 75 years, with excellent result, and the same was true where he operated on strangulated hernie in infants of 4 and 6

months of age. This operation is not one from which the general practitioner should shrink in an emergency; it is very simple, the chief point being to remember to cut down to the aponeurosis of the external oblique and divide this above the point of strangulation.

Dr. LUCIUS W. HOTCHKISS said that he too had operated successfully for the relief of strangulated hernia in young infants, and also in a woman of 81 years. When the diagnosis is reasonably clear, operation should not be delayed.

Philadelphia Pathological Society.

Jan. 11, 1900.

NEW METHODS OF STAINING THE SPOOROZOA OF MALARIAL FEVER.

Dr. ALBERT WOLDERT, in a paper on this subject, said that for general work examination of the fresh blood is preferable to the stained methods in examining for the malarial parasite, on account of that method giving better opportunity for studying the general characteristics of the hematozoa. However, the stained methods have their place, because in this way the specimen becomes portable and remains permanent. The stained method requires a very careful technique, and another objection to it is that it frequently requires from fifteen minutes to two hours. A method which will shorten this period has been devised by Fletcher and Lazear, of Baltimore, Md. It is a combination of the fixation method of Benario and a stain first employed by Marchoux. Two solutions are required, a fixation and a staining fluid. The first consists of a .25 per cent. solution of formalin in 95 per cent. alcohol; the second of a saturated aqueous solution of thionin (Cogit) in 50 per cent. alcohol—20 c.c. and 2 per cent. aqueous solution of carbolic acid, 100 c.c. The blood specimens are fixed for one minute in the fixation fluid, and afterward stained for fifteen seconds. The whole process can be completed in two minutes and the specimens are permanent. The second stain is one prepared by the speaker in an attempt to make the Prince blood stain. It is a triple stain and solution No. 1 has toluidin blue, gr. xv.; distilled water, 3iv. Solution No. 2 has acid fuchsin, gr. xv.; distilled water, 3ss. Solution No. 3 is 2 per cent. aqueous solution of eosin. The specimens are fixed by heat and stained for five minutes. By the latter the organisms are easier to find than in the former method.

Crescent organisms were exhibited, which had been found on the tenth day and after 90 grains of quinin had been given.

Dr. A. O. J. KELLY said he had used the first method and found it a useful and easy one.

Dr. J. A. SCOTT does not believe that any quick method of staining is needed, since it is so easy to study the fresh specimen of blood.

STATUS LYMPHATICUS WITH GASTRIC TETANY.

Dr. ALFRED J. HAND presented specimens from a case of this condition in a child who had manifested symptoms of tetany with symptoms also indicating involvement of the higher nerve centers. Stroking either side of the face produced contraction. Coughing and dyspnea were also present. Fever was absent until shortly before death. At the autopsy the thymus gland was found to weigh 10 grams. The heart was normal, the liver suggested amyloid degeneration and weighed 232 grams. There was a supernumerary spleen present. The pancreas was normal, stomach walls thickened, and there was hyperplasia of Peyer's patches.

Dr. SIMON FLEXNER said that, in an epidemic of diphtheria, he has noted the enlarged thymus, and hyperplasia of the lymph tissue of the intestines.

SYPHILIS OF SPINAL CORD.

Dr. JOSEPH SAILER presented a specimen from a man who gave a history of having been wounded by poisonous arrows thrown by uncivilized natives in South America. He said he was wounded in ninety places, and at each point a chancre (?) developed. A scar had also been present on the penis. Section of the spinal cord was shown, in which could be seen two large thrombi.

PULMONARY ACTINOMYCOSIS.

Dr. SIMON FLEXNER presented a specimen of lung showing actinomycosis, from a woman of middle age, who had suffered from cough and pain in the chest. A swelling subsequently developed in the chest, and ruptured, leaving a sinus which

communicated with the lung. In the pus actinomyces granules were found. At the autopsy the lower lobes of both lungs were found involved. Section showed consolidation of the tissues, with here and there yellowish masses, surrounded by overgrowth of connective tissue. Microscopic sections showed the micro-organism.

ADDISON'S DISEASE.

Dr. FREDERICK A. PACKARD presented specimens of suprarenal glands taken from a patient with Addison's disease. There had been several brownish spots in the region of the right nipple. Two features which led to the diagnosis were the low-tension pulse and gradual failing in general health. In the right suprarenal gland tuberculous nodules were found. The left was also diseased.

Jan. 25, 1900.

TYPHOID FEVER SYMPOSIUM.

Dr. A. C. ABBOTT reviewed the epidemiology of the disease. While typhoid fever has always been regarded as an autumnal affection, there are certain years in which the number of cases has been much higher in the spring than in the fall. This is particularly noticeable in the records of Philadelphia for last year. One interesting feature noticed in the epidemic of typhoid fever here last year is that the mortality in different wards was two or three times what it was in others. In those where the mortality was highest, the residents had been furnished with water from the Queen Lane reservoir, which it is believed had been contaminated.

Dr. J. H. MUSSEY spoke of the value of clinical laboratory methods in diagnosis. One to-day recognizes the value of laboratory facilities as an aid to diagnosis, particularly of the infectious diseases. While an examination of the excretions in typhoid might be of some aid, yet such results obtained would not compare with the positive evidence furnished by the Widal reaction. It has been found that where careful technique has been followed in making this test, it has proven correct in over 98 per cent. of the cases of typhoid. Some inaccuracies doubtless occurred from the fact that some observers diluted the blood too much, thus furnishing ground for failure in some cases. The reaction in this disease may at times be intermittent, or delayed; yet it should be found in all cases if persistent efforts are made. The reaction is of the greatest importance in clearing up the diagnosis of an obscure nature. One precaution is that the reaction may be obtained in cases in which the patient previously had an attack of enteric fever, thus leading to an error in diagnosis. An examination of the blood is important. As is known, the leucocytes are not increased, and if they should be, that might indicate a septic process or an impending perforation of the bowel. Their increase after perforation chiefly affects the polynuclear forms. The diazo reaction is important and has been found in 90 per cent. of the cases. The presence of this reaction during the progress of the disease, however, limits the usefulness of this test.

Dr. A. O. J. KELLY briefly reviewed the statistics of the German Hospital. During the past two years the dried blood has always been used in making the test; 1002 tests were made in 557 cases of typhoid. In some instances the wet method was tried as a confirmatory measure. The dilutions were 1 to 10 or 1 to 15 in fresh bouillon cultures. By the dry method a positive Widal reaction was not only obtained in typhoid fever, but also in cases of tuberculosis, abscesses, rheumatism, appendicitis and other diseases. After a very thorough trial he is convinced that the dry method is not so accurate as the wet.

Dr. A. C. ABBOTT stated that at the city laboratory the dry method has been used as a routine measure, the wet in some instances. By the dry, 3 per cent. of errors occurred.

Dr. H. W. CATTELL gave the statistics of the Woman's Hospital. The percentages in which the positive reaction was obtained was quite high. In his opinion the diazo reaction is important in clearing up cases of summer diarrhea in children, many of which are undoubtedly typhoid. Dimmel has spoken of a method of differentiating the typhoid bacillus from the colon. This consists in growing the micro-organism in a bouillon culture with the liver, and afterward using the fermentation and reaction test with litmus paper. If the litmus turns red, it is an indication that the organism was that of typhoid.

Dr. J. McFARLAND spoke of the cases in which the reaction was obtained at the Medico-Chirurgical College. He recognizes

element is always present. Tschisch speaks of *coitus reservatus* that the personal equation, by many observers, may vary considerably in obtaining the Widal reaction by the dry method.

DR. J. D. STEELE spoke of the cases which occurred at the Presbyterian Hospital. His experience with the dry method agrees with that of Dr. Kelly, in that the dry does not seem to be as reliable as the wet. His dilutions were 1 to 10 and 1 to 20. The cultures were used from twenty-four to thirty hours. In obtaining the Widal reaction he noticed one avenue which may lead to failure, in that in most specimens, near the edge of the hanging drop, the bacilli are seen to become non-motile or give a picture of clumping. He has not called the reaction positive unless clumping was observed some distance away from the edge of the cover-slip. Regarding the diazo reaction, he has made examination of the urine and believes its persistence is an indication that a relapse is imminent or that the convalescence will be delayed. Ordinarily it would disappear in the latter weeks of the disease.

DR. SIMON FLEXNER spoke of the atypical lesions found in enteric fever, and of typhoid septicemia. As is known, many cases of typhoid have been reported in which no intestinal lesion of the bowel occurred, and yet a positive Widal reaction was obtained. In these the micro-organisms were discovered in the liver, spleen, lymphatic glands and bone marrow. Through the blood their distribution was made possible, yet it is exceptional to find the bacillus in the circulating medium, a true typhoid septicemia. While in Manila, he learned that the intestinal lesions in typhoid were very slight. In fact, many could not be diagnosed at the autopsy table, and yet the micro-organisms might be found in the blood.

DR. T. G. ASHTON believes that if proper care were exercised many epidemics of typhoid fever would be prevented. Proper care means thorough sterilization of the feces, urine, bed linen, and care of the hands in those that attend the sick. The modes of infection were detailed. In order to disinfect the stools it is advised to use four ounces of chlorid of lime to one gallon of water mixed thoroughly with the stool and allowed to stand for one hour; 10 per cent. carbolic acid might be used, as also bi-chlorid of mercury, 1 to 500. The latter solution should be acidulated and allowed to stand for a longer time. To sterilize the bed linen, 3 per cent. carbolic acid solution will do. It should be immersed in this solution and then boiled.

DR. J. MCFARLAND spoke of the present outlook of the serum treatment. He thoroughly reviewed the literature on the subject. In trying to manufacture artificial antitoxin from the horse, by first injecting pure and afterward sterile cultures, he was not successful. One point should be remembered in this connection and that is, any remedy which is recommended as an antitoxin in typhoid should also be antimicrobial in action.

Chicago Medical Society.

Jan. 24, 1900.

OCULAR THERAPEUTICS FOR THE GENERAL PRACTITIONER.

DR. ALBERT B. HALE read a paper on this topic, and said: New drugs from the chemist's laboratory are constantly being added to the physician's table, and some deserve to be retained both by specialists and general practitioners. Among drugs useful in ophthalmic therapeutics we have, of the newer ones, four that are particularly valuable.

Holocain.—This is a synthetic product, related to phenacetin, so that its name is merely imitative of cocaine, which it may in many cases supplant. Its salt, the hydrochlorid, is soluble to about 2.5 per cent. in cold water, and should be applied in 1 per cent. aqueous solution. It has particular advantages for the general practitioner. In removing foreign bodies from the conjunctiva or cornea, for instance, it is better than cocaine, as it acts quicker, causes little pain, does not dilate the pupil, in temporary use affects corneal epithelium less, produces no ischemia, to be followed by hyperemia. It is somewhat antiseptic—enough to keep itself, at least—and can be sterilized by boiling, with no disturbance of chemical composition. It must not be injected hypodermically, nor be applied to other than ocular mucous membranes, as it is systemically poisonous. It must be prepared and kept in porcelain, not glass, as the alkali of the glass influences it.

Euphthalmin.—Of the three effects of local applications to

the eye—omitting cautery or astringency—anesthesia, mydriasis, cycloplegia, many drugs produce all three, in varying proportions. Modern chemistry has supplied holocain for simple anesthesia. As yet, no drug produces simple cycloplegia alone. Mydriasis alone, however, can now be produced by euphthalmin, a complex synthetic product. It is best used in a 5 to 10 per cent. watery solution. Here the author gave tables and cited authors to prove that cycloplegia is practically absent, and that it can be used in all cases at any age to produce a dilation of pupil for study of lens and fundus. His conclusions were: 1. No subjective symptoms are produced. 2. Only mydriasis is caused, of short duration, beginning in thirty minutes. 3. The effects are shown earlier in youth than age. 4. Ocular tension is not increased. 5. No hyperemia nor ischemia of the conjunctiva is produced, and the corneal epithelium is unaffected. 6. Accommodation is practically unaffected. 7. The normal pupil is soon restored. 8. It is apparently non-poisonous.

Protargol.—This he considers better than any inorganic silver salt yet used. It is proteid compound, containing about 8 per cent. of silver, and its bactericidal power as great as that of silver nitrate, while it penetrates deeper; is much less painful, not so dangerous to the epithelium, and can be used much more frequently; it is not so affected by light, and its brown color is an advantage for local application. Perhaps the silver nitrate is better for direct action on the gonococcus, but for all other inflammations or irritations of ocular membranes, protargol, in 5 to 10 per cent. watery solution, is much better for the general practitioner.

Extract of Suprarenal Capsule.—Abel (Johns Hopkins) was quoted with reference to epinephrin. Bates' experiments were confirmed, showing that it is astringent more than hemostatic, acting through the uninjured vessel wall. It is useful for cosmetic purposes, to blanch a red eye, to assist in prolonging anesthesia with cocain or holocain, to aid other drugs in treating inflammations of the conjunctiva. It is an unstable powder, spoils easily in the presence of water, and must therefore be mixed fresh for use, as it has no well-defined solubility.

PREVENTION OF TUBERCULOSIS.

DR. CHAS. J. WHALEN presented a paper on this subject; it will appear in THE JOURNAL.

TREATMENT OF FRACTURES OF EXTREMITIES BY MEANS OF SCHOENBORN-BEELE SPLINT.

DR. EDWARD H. LEE followed with a paper on this topic. He gave a detailed description of this splint, and demonstrated its usefulness on a patient. Among the many advantages which it offers are that it can be applied immediately; it is light and neat; there is no necessity of padding with cotton; it is not apt to produce decubitus; it may be removed and put back in place in a very short time, and the cost of the material is moderate. He knows of no other that will adapt itself so perfectly to the form of the limb as this one. In 1891, during his term of service as interne under Professor Schoenborn at the Julius Hospital in Wurzburg, Germany, he had the opportunity of the splint. For the past seven years he has used this method in the Cook County Hospital, the Alexian Brothers' Hospital, and in private practice in a great number of cases. It has been used extensively by a number of the internes of the Cook County Hospital, and by some of the members of the attending staff, and the results have been excellent. Dr. Lee described the application of the splint to various fractures.

NATURE OF NEURASTHENIA; A STUDY OF RECENT LITERATURE.

DR. R. M. LADOVA read a paper on this subject, saying that this disease is a general chronic functional neurosis, a state of continuous exhaustion and irritability of the nervous system. The predisposing causes are heredity, either neuropathic or arthritic. The determining causes are trauma, anemia, toxemia, overwork, worry and anger, exhausting chronic and acute diseases, misfortune, alcoholism, mental shock, violent emotions, crisis of puberty, sexual and other excesses and platonic love. Where heredity is present, the trouble begins early in life and runs a more severe course. Attention was directed to the two hundred observations made by Bidon, who holds that neurasthenia is etiologically allied to degeneracy. A study of the posterity of neurasthenics strongly points toward this view. Grandholm regards the too extensive social intercourse of the world as the principal cause of neurasthenia. Gattel has collected one hundred observations and claims that the sexual

as a potent cause, and Pleury of platonic love. Unrequited love and otherwise unfortunate love affairs may be safely added to the list. Biernacki found that fresh blood of neurasthenics coagulated slowly with a small amount of fibrin; the blood is otherwise normal. This sedimentation anomaly is present in most patients, and depends on the small amount of fibrinogen; its constancy speaks for its primary nature. Charcot states that gout, diabetes, obesity and chronic rheumatism, on account of their frequency in neurasthenic families, point to a disturbance of the processes of oxidation. Functional neuroses follow psychic excitement, which speak little for their primary nature. None of the theories that have been so far advanced to explain Beard's disease have been satisfactory. The toxic origin of neurasthenia can not be denied. Priantaphykides reports fifty undoubted cases of malaria where neurasthenia is the only symptom. Grave cases follow light attacks of influenza. Is fatigue a phenomenon primarily dynamic or toxic? It is possible that the toxin only acts as an irritant to the nerve-cell, exciting it to over-activity. Fatigue and chemical phenomena accompanying it are in proportion to the amount of nerve energy the muscle receives from its centers. A study of walking and bicycling riding points to it. In riding or walking up hill, where volition works against the force of gravity, fatigue is more evident. Functional neuroses are probably not primary diseases of the central nervous system, but a secondary symptom-complex in consequence of the activity of products of primary oxidation disturbance of the nervous system.

Lehigh Valley Medical Association.

Mid-Winter Session, Allentown, Pa., Jan. 25, 1900.

OBSTETRICS IN LAST HALF-CENTURY.

DR. A. H. HALBERSTADT, Pottsville, read a paper on "Some Reminiscences of the Last Half-Century," alluding to the changes since the time of Meigs, Hodge and others in the practice of obstetrics. He thinks the pre-eminent standing of these gentlemen elevated the chairs of obstetrics in the colleges, their reputation being national; the end of the greatest epoch in this art ended with their deaths. The regeneration of gynecology by Sims led a stampede from obstetrics that still continues. Every manipulation in obstetrics is surgical and no necessity exists for the division of labor based on the use of the knife. The principal advances are asepsis and the use of anesthesia; the former, except in more intelligent detail, is not new; the latter is the greatest boon to parturient women.

ELECTRICITY INTERNALLY TO THE STOMACH.

DR. BOARDMAN REED, Philadelphia, read a paper on this topic. He considers this easy of employment, and exhibited the apparatus which he employed. He has obtained excellent results in cases otherwise intractable. Certain patients require stimulation, and thus he obtains it. Much is necessary in the way of diet and care of the general system.

THE PHYSICIAN AND THE LABORATORY.

DR. C. KNAPP, Wyoming, read a paper on the "Value of the Laboratory to the Physician." He pointed out that it greatly aids in diagnosis and proper treatment of disease, and instanced the X-ray, pathology, bacteria culture, microscopic work, histology, photography. Observation now takes the place of theory, thus leaving less to empiricism in practice. Every practitioner should be thus armed, and his offices should be fitted to enable him to do the work promptly and satisfactorily. He described the proper fitting of a laboratory, and urged the young physician to work earnestly, carefully and make himself sure as to what he obtained. Above all, the note-book should have a place and record everything observed.

QUADRUPLE AMPUTATIONS.

DR. J. C. BIDDLE, Fountain Spring, read a paper on "Quadruple Amputations." He traced the history of surgery from the earliest times, showing the great advances at present, due to the knowledge of the use of anesthesia, asepsis, the ligature, and prevention of hemorrhage. We must not be in too great haste to operate, nor object to do so when it is necessary. In amputations, we must have enough skin, muscle and fascia to cover the bone, thus preventing retraction or conical stump. He has performed one quadruple amputation, removing both feet and both hands in the case of a man who had lain all night deep in the snow till the frost had caused the death of these

members; this man made a good recovery. But one other such case is on record. He does not favor the drainage-tube, and regards it very important that we should make early arrangements for the wearing of an artificial limb, and not wait months or even a year, thus causing the patient to be awkward in its use. He prefers chloroform, and for ligatures the silk-worm gut.

DR. W. J. HEARN, Philadelphia, agreed with the speaker, but prefers the drainage-tube in amputations, as indispensable.

DR. W. L. ESTES, Bethlehem, said modern methods make conservation more advisable than formerly, so it is important, if there is the least doubt, to employ careful hemostatic and anti-septic dressing and wait hours, if best, before amputating; there is no need, in the majority of cases, for immediate operation. During the early stages of acute anemia, ordinarily called shock, we should not operate. Let the heart regain its tone somewhat. He uses tourniquets for bleeding, and places them on the crushed surfaces or just above the torn skin. Drainage is imperatively necessary, especially for infected wounds.

DR. J. B. ROBERTS, Philadelphia, called attention to the necessity of applying means to check hemorrhage at the locality injured, not far above, as is often done by the improperly taught policemen, who cause much damage by the tight bands which they apply far above on the injured limb. He believes it is a mistake to operate in a hurry. There is no need of it. He stops hemorrhage, obtains asepsis, and then waits for reaction.

DR. H. AUGUSTUS WILSON, Philadelphia, directed attention to the need of the early use of artificial limbs, not delaying for months, which often causes great awkwardness and difficulty in their use. Also, this delay causes wasting by non-use of the limb, and pain when the artificial limb is placed. Surgeons must prescribe these limbs with as much care as they should do everything else.

Toronto Clinical Society.

Stated Meeting, Toronto, Ont., Jan. 4, 1900.

KNITTING NEEDLE IN PELVIS.

DR. GEORGE A. PETERS showed one-half of a knitting needle which he had extracted from the pelvic cavity of a very stout woman. The patient had sat down upon her knitting, one needle passing into the buttock half its length and breaking off. In its passage into the right buttock it had grazed the tuber ischii of that side. On first examination the needle could not be felt, but a week later the surgeon examined vaginally and found the foreign body on the lateral plane of the pelvis lying on the tuber ischii. It was removed with a pair of forceps through a vaginal incision.

SYPHILITIC NECROSIS OF CRANIUM.

DR. WILLIAM OLDRIGHT showed a man, aged 54 years, with a large syphilitic ulceration on the vertex about four inches in diameter and of irregular outline. Twenty-five years ago the man had become syphilized and at that time was very much addicted to alcohol. At the onset of the present lesion he suffered from headache, but no other symptom. About two years ago he had a fall and cut the scalp, which never healed very well; and in August, 1898, it commenced to discharge. By September, 1899, there was a large ulceration and the bone beneath was corrugated and black. Pulsation from the brain was discernible through the pus. Operation was performed late in September, 1899, cutting through both tables, 2 by 2½ inches having been removed. This was under anesthesia, but since that time portions have been removed without it, the only discomfort recorded being some buzzing in the ears. At first the patient was put on iodid of potash, 10 gr. three times a day gradually increased until at the present time he is taking 35 gr. three times a day. Treatment is suspended at intervals of two weeks when the bichlorid is administered.

CARDIAC ANEURYSM.

DR. W. B. THISTLE presented a specimen, with the history of the case, from a married woman, aged 32 years, who had never been pregnant, nor syphilized, although the husband was drunken and worthless. She was admitted to the hospital with weakness, shortness of breath, and marked pallor, some edema below the eyes; pulse rapid but regular. Examination of the heart revealed a double aortic murmur traceable up into the neck and down along the sternum. Water hammer pulse was

very distinct, also throbbing of the great vessels of the neck. There was also capillary pulsation very distinctly seen in the patient's finger nails. The apex was displaced somewhat to the left. Later on there appeared a systolic murmur at the apex, traceable to the left, and still later a presystolic one accompanied by a very pronounced thrill; also a pericardial friction sound. First examination of the urine revealed no albumin, but later on it was found in abundance. The diagnosis was malignant endocarditis. Death occurred from uremic convulsions, after seven weeks in the hospital. At the autopsy, the aneurysm was found to be in the ventricular septum, extending up into the auricular, so that it was partly in both septa. It was two inches in length and an inch in breadth. The clot turned out left a smooth wall with calcareous deposit about the opening. The mitral valve showed nothing abnormal, contrary to expectations.

ENDOCARDITIS OF RIGHT HEART.

DR. W. B. THISTLE also showed this specimen. The case was one of chronic endocarditis, occurring in a rheumatic girl, aged 12 years. It was of interest because all four valves showed marked changes; very pronounced mitral and just as pronounced tricuspid; with distinct vegetations on the aortic and also on the pulmonary valve; and, particularly interesting when the specimen was recent, there seemed to be a little tuft on each segment of the pulmonary valve, very distinct. This is an extremely rare condition. Some authors say you never get endocarditis affecting the pulmonary valve.

TUBERCULAR TESTICLE.

DR. H. A. BRUCE showed this specimen, the condition beginning in the epididymis, with a sinus opening through the scrotum, discharging pus. The patient was a young married man of 26 years, with some enlargement of both testicles for about a year, although the sinus only existed about four weeks. He also had one on the other side. The left one led to the globus major and the right to the globus minor of the corresponding side. The disease was in both testicles. Examination per rectum showed the seminal vesicle of the left side enlarged. The left testicle was removed entire, and as the patient was particularly anxious that some portion of one or the other be left, only the vas and epididymis of the right were removed. Later on this portion will have to be removed.

EXTRAORDINARY CASE OF CANCER.

DR. WM. BRITTON related the history of this case and Dr. Anderson described the pathologic specimen, from a corpulent woman of 57 years. She first came under Dr. Britton's care in July, 1899, with edema of the left ankle and a portion of the leg as far as the calf. In the absence of local causes for this, pressure was suspected higher up and a vaginal examination revealed a hard nodular mass completely filling the pelvis. A portion of the uterus could not be made out at all, nor either ovary or tube. With the finger in the rectum the tumor could be pressed forward so that the intestine was patent to a certain extent. An exploratory incision was performed and a large amount of ascitic fluid spouted out; the omentum was thickened and very much congested. The tumor was adherent in many places. As it was not thought advisable to proceed any further, the wound was stitched up. Five days later oozing of ascitic fluid began from the upper part of the incision and from the stitch openings. This continued about two weeks, when healing took place by granulation. During the last week of life vomiting was almost incessant. At the autopsy it was found that the tumor had nothing to do with the uterus, but arose from the left ovary. The whole peritoneum, both parietal and that covering the viscera, was studded with little elevations about the size of a millet seed, covering the broad ligaments, the whole surface of the tumor superiorly, and every portion of the peritoneum. They were most numerous over the stomach, mesentery, and colon. In front of the pylorus there was a great deal of thickening of the peritoneum, while posterior to it there was a nodule the size of a walnut, coarse and grayish in structure, having the appearance of scirrhus cancer. Macroscopically the condition was thought to be due to tuberculosis, but on examination with the microscope it turned out to be a papillomatous cyst of the ovary, the condition being shown microscopically in both ovaries.

ECLAMPSIA.

DR. K. McILWRAITH reported two cases of eclampsia, in prim-

iparae, aged 19 and 24 years respectively, in whom treatment by morphia, calomel and salines proved effectual.

DR. W. H. PEPLER lauded *veratrum viride*, which had proved an excellent remedy in his hands, and condemned pilocarpin, as death had resulted in the only case in which he employed it.

DR. WM. BRITTON thought that venesection should not be overlooked in sthenic cases.

Cincinnati Academy of Medicine.

Jan. 15, 1900.

FRACTURE AT BASE OF SKULL; RUPTURE OF MIDDLE MENINGEAL ARTERY; RECOVERY.

DR. S. P. KRAMER presented a patient, first seen on Nov. 3, 1899, a few hours after he had fallen down a flight of iron steps. He was semicomatose, with slow pulse, and semiparesis of the left side, especially of the arm and leg. The tongue was deviated toward the left side. The pupils were sluggish, with no difference in size. He did not respond to sound. In addition to this there were hemorrhages into the conjunctivæ, and also from both nostrils, which increased in the following twenty-four hours, and were considerable in quantity. There was also hemorrhage from the ear. The eyes were very much infiltrated. A diagnosis of fracture of the base of the skull was made, together with rupture of the middle meningeal artery, chiefly on account of the paresis. On November 5 the skull was laid bare and a badly comminuted fracture found, involving the squamous portion of the temporal bone; also the parietal. A rupture of the middle meningeal artery was also discovered. Just above the dura was a large clot of blood. Opposite this the dura was cut and torn, and from the aperture a small portion of the cortical substance was lost. After everything had been thoroughly cleansed, the dura was sutured and a drain inserted. On the day after the operation he had an attack of Jacksonian epilepsy, which affected the left eye, particularly the muscles of the neck, face and eyes. On the day following he had another similar attack. He came to the conclusion that these were due to iodoform poisoning, as he had used an iodoform gauze drain, that was discontinued, and a plain gauze one substituted. No other attacks came on. The recovery from that time was interrupted. There was still, as shown by Dr. Kramer, a small stitch-hole abscess in the scalp, and there is also now remaining a little deviation of the tongue to the left.

AORTIC DISEASE COMPLICATING GONORRHEA.

DR. GILBERT L. BAILEY presented a patient who had an attack of gonorrhea seven years ago. This was followed by a stricture of the urethra, which stricture was cut. Following this he had a lymphangitis involving the left leg, and he has suffered from this condition ever since. He has also suffered from phlebitis. The left leg was larger than the right. He has an aortic murmur due to an endocarditis occurring at the time of the attack, also probably of gonorrheal origin. There is considerable hyperplasia of the subcutaneous connective tissue, resulting in great thickening of the limb.

LOCOMOTOR ATAXIA: ETIOLOGY.

DR. D. I. WOLFSTEIN, in a paper on this topic, gave an exhaustive review of all the causes that have been believed to have caused this disease, his own personal opinion inclining him to the view that syphilis is not so important as writers have given us reason to believe.

DR. PHILIP ZENNER upheld the view of previous syphilis. He said that it could not be borne too strongly in mind that syphilis is often introduced into the system through unknown channels and not recognized at the time by either patient or physician. Certainly lesions of syphilis have been found when no history of syphilis could ever be obtained. Not infrequently there is great difficulty in obtaining a history of the disease even when the lesions are typical. He mentioned several cases in support of this, that had come to his attention very recently. A patient had been sent to him by his family physician. Examination revealed locomotor ataxia, but no marks of previous syphilis could be found, even after the closest examination, and the patient absolutely denied infection. He saw the family physician the next day and was informed that he, the family physician, had treated the man for constitutional syphilis, his wife for constitutional syphilis; that the latter had had a number of abortions, and that all the children who had come into the world had died of hereditary syphilis. Had he not seen

the family physician he would have entered the case on his books as one of locomotor ataxia without previous syphilis.

A few months ago he saw a woman with paresis. He sent for her husband and inquired if he had ever had syphilis, but it was absolutely denied. The man, on leaving the office, casually announced that he was going to see his oculist. Calling up the latter he found that the husband was suffering from atrophy of the optic nerve. On inquiring from the family physician he found that the latter had treated the man for constitutional syphilis. Since that time the man has developed other symptoms of tabes.

In another case of a woman with locomotor ataxia, he sent for the husband and inquired for syphilis. Here it was also denied. He learned from the wife that she had had many miscarriages, and that a few months after marriage she had developed an eruption covering the body. Her husband has since developed paresis.

Many other similar cases have occurred in his practice, and he always expects to find syphilis in locomotor ataxia, and is not very often disappointed.

DR. F. W. LANGDON said that while he does not believe that syphilis is always the cause of tabes, he believes it is a very important antecedent in very many cases. He has had a number of cases of tabes in which no syphilis has been present. A very prominent etiologic factor is the strain put on the sensory neurons. The more highly organized the individual or race, the more delicate the sensory system and the more liable the latter is to give way under strain. The essayist mentioned how uncommon tabes is among the lower races of man, though syphilis is far more common among them than in civilized communities. It would seem from this one point alone that there is something else lacking as an underlying factor, and he is inclined to put it to this strain on a sensory mechanism, already overly delicate. He does not regard it as a great mystery that, with the progress of atrophy of the optic nerve, the disease tabes is frequently checked. With the progress of optic atrophy, man is necessarily compelled to be less and less active, and he may lead an almost vegetative existence. In this way the strain is taken off the sensory neurons in general, and that, in his judgment, is responsible for the cessation of the progress of the disease. Antisyphilitic treatment, while often advocated in tabes, in most cases, so far from doing good, caused actual harm; for tabes is not a gummatous disease.

DR. JOSEPH EICHBERG said that, in reference to the causation of locomotor ataxia, the neuron theory seems to be plausible, because the changes which take place in the body of the nerve-cell show that degeneration frequently occurs from over-stimulation of the neuron. The fact that Fournier, in 5000 cases of syphilis, was able to find 11 per cent. with locomotor ataxia, is an argument that does not admit of much discussion. It can not be said that when 11 per cent. of 5000 patients with syphilis have tabes, these are accidental cases, nor will it do, on the other hand, to say that tabes is always dependent on syphilis. The same sort of reasoning will apply to every infectious disease. It does not follow, because out of a number of individuals only a limited number show the infection, that the reputed cause of the disease is not operative in the manner stated. The fact that an individual may have had locomotor ataxia and have subsequently acquired a syphilitic sore does not disprove the fact that he had a primary sore before the tabes developed, because reinfection is not an unknown thing in the history of that disease. He believes that the whole pathology of the disease is as yet in chaos; while the lesion is known, the existence of the neuron and its liability to undergo degenerative changes, the result of nutritional disturbances, is indisputable, though the exact manner in which these changes are brought about is purely speculative.

DR. J. W. ROWE believes that the theory of over-stimulation of the neuron, followed by exhaustion, fits well with the etiologic features named: that this exhaustion can be produced by excesses in alcohol or in venery, from overwork, or from the presence of an exhausting disease such as syphilis. In practical medicine we are accustomed to at least confirm our diagnosis from the effects of our therapeutics, as for instance the results of iodid of potassium in syphilis and quinin in malaria: the best neurologists in the country admit that the one therapeutic measure which has any possible chance of staying the

progress of tabes is absolute, unqualified rest. By this latter method of treatment it might be possible to confirm the idea that exhaustion is the cause of tabes.

OCULAR SYMPTOMS OF TABES.

DR. LOUIS STRICKER read a paper on this subject. He called attention to the variety of symptoms on the part of the ocular apparatus that may be present in this disease: the Argyll-Robertson pupil, paralysis of the extrinsic muscles attended with strabismus and ptosis, and lastly the peculiar primary atrophy of the optic nerve, which latter, when occurring early in the disease, is curiously enough frequently followed by a cessation in the progress of the tabes.

Chicago Laryngological and Climatological Society.

Dec. 29, 1899.

HOME TREATMENT OF CONSUMPTION.

DR. JOHN A. ROBISON read a paper on this subject, and in it arraigned the profession for neglecting to place their home patients under the proper conditions for cure. He outlined the home treatment to consist essentially of the open-air method, and a minute supervision of the patient's daily hygienic and dietetic habits.

DR. O. T. FREER said that exercise, when fever exists, will increase this, and that the rest treatment is then indicated. The fever is not only due to the absorption of tubercle toxins, but to pneumonic and bronchitic inflammations. It is better to give less food than more than the stomach can take care of, as these patients are very apt to have indigestion. It is especially unwise to give fluid fats, although solid fats are indicated, as the muscles waste less than the fat of the body, but fluid ones, such as cod-liver oil, increase indigestion, perhaps by covering the solid particles of food with an oily coating. Of the fluid fats cream is the best. It is now the fashion to prescribe milk generously, but he does not think it wise to overdo this. He believes a dry diet is preferable. The fresh-air treatment is a matter of great importance, as it means the absence of bacteria; the air of rooms has more bacteria than the air of the streets.

DR. EDWIN KLEBS said drug and fat treatments come and go, but the individualizing of cases is neglected. The paper impressed him with the fact that he does not make a difference in the treatment of different cases. There is an enormous difference in the indications for the treatment of various patients. The fevers differ; the capacity for exercise differs. Dr. Freer spoke of putting the patient to bed. There has been a great controversy on the other side of the water on the rest and exercise question, and the war has been bitter. Dr. Klebs, from four years' sanitarium practice abroad and home, is of the opinion that patients do better when you can keep them out of bed, keeping the windows open when they are bed-ridden. The fever can be reduced and the psychic effect is good.

DR. J. A. ROBISON recommended that the windows of the bedroom be kept open, but he went a step further, and would have some patients practically sleep out of doors without disastrous results. They can build little balconies and sit wrapped up in steamer chairs, kept warm with hot water-bottles for seven hours a day with good results, the patients being improved but not cured. We can not send many patients away, and sometimes it is not desirable. When we keep them at home we know what they are doing. The dietetic and hydrotherapeutic treatments seem simple, but are hard to put into practice with home patients.

DR. KLEBS does not agree with Dr. Robison that the patients need not be seen oftener than once a week, for it is better to keep in contact with them. He has followed in this method a plan which works well in the city: He has a nurse trained in dietetics and hydrotherapy, who visits the patient and sees that the instructions are carried out. They get the patients to work, and keep them cheered up, which is very important.

DR. W. E. CASSELBERRY said that modern sanitarians consider fever as a prohibitive of exercise, and yet western experience opposes the rest treatment. He has seen detrimental effects follow exercise at a temperature from 99 to 101.5 F. Exercise increases the temperature from .5 to .4 and .6 of a degree, but this does no harm. He is not in favor of putting the patient to bed; the mental effect is bad. He has not seen any mention

made of walking as an exercise, which is a very valuable form and may be called the poor man's exercise; it is easily regulated, and the amount should be graduated, commencing with short walks and increasing their length gradually until the patient walks two or three miles a day; while walking he should take moderate inspiratory exercise, holding the breath for several steps. It is a great mistake to tell such patients to take a full bath; as many of them do not know what that means. He has them stand in a bathtub filled with water at a temperature of 50 to 60 F., when robust; if not robust he has them commence at a higher temperature, 70 to 80 F., and gradually reduce it. The temperature of the bath-room should not be less than 70 to 80 F. The bath should not last over thirty seconds, the patient standing in the tub and rubbing the water over himself quietly, following this with a brisk rubbing with a crash towel, the friction and motion having a stimulating and tonic effect.

In regard to feeding, he raised the question as to the use of alcohol—not as a food but as a stomachic; as an appetizer before meals. He thinks most patients can digest more food than their desire for food tempts them to take, unless it is in the advanced cases; and as a tonic he is accustomed to allow them wine or beer with their meals. Consumptives should never wear heavy underwear. Too heavy is debilitating, and provocative of catching cold.

Dr. J. A. ROBISON, in closing the discussion, said that his paper was merely suggestive, but he hoped the profession would adopt a more systematic method of home treatment.

CLIMATIC TREATMENT OF TUBERCULAR LARYNGITIS.

Dr. E. F. INGALS opened the discussion on this topic by saying the climatic treatment has not been as satisfactory as in pulmonary tuberculosis. He has often thought it necessary to restrain patients, with tubercular laryngitis, in their journeyings. He has seen some who were injured by sojourning in high altitudes, but others who were not, nor by hot or dry or dusty climates. In fact, some seemed to improve, but he believes the improvement was due to a betterment in the general condition of the patient. As a rule he advises patients to keep away from the high altitudes, and urges the low ones, preferably the warm and dry. He would not send cases of tubercular laryngitis to Arizona, as it is too dusty. They are better in the mild climate of the South than the vigorous one of the North. Some would be better in a warm, damp climate. While a change of climate in the early stage often gives improvement, he believes it is generally due to that of the lung troubles.

Dr. W. E. CASSELMERY said his experience was confined principally to nine years spent in the Rocky Mountains, from Las Vegas, Albuquerque, Phoenix, Cheyenne and the borders of Colorado. The altitude is high, the climate dry, with abundance of sunshine and ozone. The sun is hotter here on account of the rarity of the atmosphere, and it is cooler in the shade. The winds vary very much, according to the particular spot. Denver, Estes Park, etc., are not very windy, nor so constantly dust-laden as are Phoenix, Albuquerque, etc. The outdoor life there is a great feature in the cure.

He said that Dr. Solly, in a report to the Pan-American Medical Congress, some years ago, tabulated 45 cases of tubercular laryngitis. In 25 the lungs were infiltrated, 20 had laryngeal ulcerations. Of his 25 infiltrated cases 17 lived an average of fifteen years—8 became worse and died, these averaging four years. In the 20 ulcerated cases, 5 were alive at the end of 8½ years, and 15 died or were worse at the end of 2½ years. Many died of pulmonary tuberculosis. There was, therefore, 64 per cent. of improvement or arrest; none of the patients died in the early stages of the disease.

Dr. Levy of Denver had also reported 42 cases in which 12 improved. One was cured, 2 improved after four years, 5 died and 7 were improving at the time of the report.

Dr. C. expressed it as his conviction, from personal experience and that of others, that there is nothing inimical to laryngeal tuberculosis in the climate of Colorado and New Mexico. He does not think high altitudes any contraindication, but that dust is, especially in alkaline regions. He does not see any reason for thinking altitude per se is inimical. This idea prevails among the profession, but the majority of cases do not do well anywhere. He does not see any direct curative agency in any climate, and thinks the good results secured are secondary in their nature.

Dr. EDWIN KLEBS said he had observed the influence of climate in cases of tubercular laryngitis in Denver; the Alps; the Black Forest; Falkenstein; in Davos; Phoenix, Colorado; Arizona, and North Carolina. He believes that when climate benefits the pulmonary tuberculosis it benefits the tubercular laryngitis; but climate is of secondary importance, as none is specific; it is only an adjunct.

Omaha Medical Society.

Jan. 23, 1900.

THREE ABNORMAL OBSTETRIC CASES.

Dr. W. O. BRIDGES presented a report on this subject. Two were cases of shoulder presentation, and in neither was the head impacted in the pelvic outlet. He was able to convert each, by bimanual manipulation, into a cephalic presentation and deliver, one with forceps and the other without. The most interesting feature of one was the fact that he could get the head over the neck, but it would slip away and be re-converted into a shoulder presentation with every new pain. To prevent this he resorted to profound anesthesia, then again secured the head in proper place and held it firmly until it was well engaged. The third case was one of albuminuria, with marked accumulation of liquor amnii, still further complicated by a central implantation of the placenta. When he was first called, he was unable to prove pregnancy present: he could get no fetal sounds; there was very great distension from fluid; edema and general anasarca were present and labor was said to be on; the cervix could not be reached at all. Later on, after some general treatment, he found a great degree of pain, no dilatation of the cervix; the pain continuous and convulsions on examination. He decided on rapid dilatation, which was accomplished in the midst of more convulsions. He found the placenta implanted centrally but not low down: this allowed him to detach, without much loss of blood. He then went through the placenta and ruptured the membranes, securing the largest flow of liquor he ever saw: it soaked the bed and ran through to the floor. By reason of the place of attachment of the placenta, he did not have the usual hemorrhage, though it was a central implantation. He therefore decided to apply the forceps instead of performing podalic version. This he was able to do at once, having a dead child. The mother never rallied, and died within an hour.

Dr. Bridges spoke of the rarity of convulsions with placenta previa, and of the very great danger involved. While it is the usual custom to perform podalic version, he was able to secure complete delivery with the forceps without loss of any material amount of blood.

HYDROCELE.

Dr. B. B. DAVIS read a paper laying great stress on the evil features of the injection method of treatment of hydrocele. He spoke of it only to condemn it as really the most radical method while posing for the most conservative one. He has used the Volkmann method repeatedly, the open operation with free drainage, but prefers the Bergmann, with free incision and removal of part of the tunica, and the closure of the walls without any drainage.

The Johns Hopkins Medical Society.

Baltimore, Md., Jan. 22, 1900.

ADHERENT APPENDIX.

Dr. H. A. KELLY reported a new method which he devised for dealing with an adherent appendix. He has found this condition in about twenty-five among the last 200 cases of abdominal section he has performed. His method consists in dividing the appendix at its base, then drawing out the mucous coat and separating beyond through the attached peritoneal covering. He explained his mode of dealing with the ureter in cases where it was involved in the tumor mass and had to be excised, sometimes uniting the cut extremities or bringing the end to the bladder and making a new connection with that organ.

FIBROID UTERI.

In removing large fibroid uteri involving the cervix, he has found it difficult to reach the vessels for ligation, and under these circumstances he splits right through the mass from top to bottom, and thus secures access to the vessel.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

61 MARKET STREET, - CHICAGO.

SATURDAY, FEBRUARY 10, 1900.

THE DIAGNOSIS OF SMALLPOX.

In the presence of an epidemic the diagnosis of smallpox may in general be unattended with difficulty, but when the disease occurs only in sporadic instances doubt may often reasonably arise, and mistake may not always be avoidable. That error should be made at the present day, in the diagnosis, ought not to be a matter for harsh criticism when it is considered that smallpox is comparatively rare, and many, particularly among more recent, practitioners have never had the opportunity of seeing a case of this disease. The action of the Philadelphia authorities recently, in response to an appeal by the County Medical Society, in opening the wards of the Municipal Hospital for Contagious Diseases to the instruction of undergraduates of the various medical schools, under the supervision of the physician in chief is, therefore, a matter for sincere congratulation, and is a credit to the intelligence and the public spirit of those with whom lay the power to withhold or to grant the desired concession.

Through the beneficent influence of vaccination, smallpox is rare, even in the large cities of the world, so that under the most favorable circumstances many practitioners may pass through a long and busy career without seeing a single case, to say nothing of the lack of clinical demonstration during the course of collegiate medical instruction. It is, therefore, as has been already stated, not surprising that cases of smallpox should be occasionally overlooked, or mistaken for other disease, and vice versa. The condition could not well be otherwise. It is worthy of mention, further, that by reason of the wide diffusion of vaccination even when the disease occurs, it does not always present the classic clinical picture. The frightful epidemics of the past are no longer met with in civilized communities, and both sporadic cases and endemics and epidemics often present a degree of mildness that renders the confounding of smallpox with other diseases exceedingly easy.

In a typical case, after a period of incubation of about twelve days, the attack usually sets in with a rigor or a succession of chills. Children may exhibit convulsions, delirium or coma. The temperature at once rises to a considerable elevation, and the pulse and respiration are accelerated. Headache and pain in the back and extremities are often present, and the physical prostration may be profound. The appetite is lost, thirst is increased, and constipation usually exists; vomiting or retching, with epigastric pain, is common. Catarrhal symptoms may also be present. On the first, second or third day a rash may appear, sometimes diffuse

and macular, like that of measles, at other times scarlatiniform and confined to limited portions of the body, particularly the hypogastric and the axillary regions; at still other times a diffuse red eruption appears on the trunk and the extremities within the first or second day, being soon followed by the lesions of hemorrhagic smallpox. Generally on the third day—sometimes earlier, sometimes later—the typical exanthem of variola makes its appearance, often earliest on exposed parts of the body, as the face and the extremities. For a short time it is macular, but it soon becomes papular, then vesicular, and finally pustular, and it exhibits throughout a peculiar shot-like hardness. As a rule, a central depression or umbilication is present, and the lesion is surrounded by an area of redness. The pock is constituted of a number of compartments or loculi, so that its contents are not wholly discharged and it does not collapse on puncture. The mucous membranes may be the seat of greyish or whitish elevated spots that soon become transformed into excoriations. The pustules undergo desiccation or rupture on about the eighth or the ninth day. If the true skin has not been involved, the crusts fall off about the fifteenth or the sixteenth day, leaving purplish-red stains; otherwise sloughing takes place on the eighteenth or the nineteenth day, leaving granulating surfaces that undergo cicatrization and are at first brownish, but ultimately become white. The initial fever subsides shortly after the eruption has appeared, and the constitutional symptoms moderate at the same time. At the end of three or four days, however, with the onset of pustulation, the febrile manifestations are renewed.

The disease in the differentiation between which and smallpox the greatest difficulty is likely to be encountered is chicken-pox. In fact, there was a time when the two diseases were considered identical, but there is abundant and conclusive evidence against this view. In the first place, typical chicken-pox may occur in those who have had smallpox or have been vaccinated; and an attack of the disease, while it confers immunity to chicken-pox, does not protect in the slightest against smallpox or vaccinia. Then, each disease gives rise only to cases of its kind. Further, the eruption of chicken-pox begins as a series of small, slightly acuminate red spots, which at first disappear on pressure. In a few hours these become transformed into round or oval, transparent, tense vesicles, about as large as split peas. These sometimes have a red base, although they are at times seated on a colorless surface. They appear most commonly and in greatest number on the trunk and the covered portions of the body; usually they are superficial, have no thickened floor, are generally not umbilicated, do not present a number of loculi, and when pricked collapse almost completely; their fluid contents become opalescent, but not purulent; they begin to undergo desiccation in from twelve to twenty-four hours; thin brownish-yellow scabs form, which in a few days crumble and fall away, leaving reddened

pigmented spots, and sometimes transient and superficial cicatrices. In contradistinction to the eruption of smallpox, that of chicken-pox generally appears in successive crops in the course of three or four days or a week, and in a single case all the different phases of the eruption may be present at the same time. The constitutional symptoms generally are exceedingly mild, and the temperature does not fall when the eruption appears, as it does in smallpox. The disease occurs almost exclusively in children, although many instances have been observed in adults. In this connection it should be borne in mind that smallpox also was largely a disease of children until the beneficent effects of vaccination almost revolutionized the incidence of the disease.

The primary eruption of smallpox may resemble that of measles, but the latter usually appears the later, and with its appearance the temperature, which originally had been high and had declined, again rises, while with the appearance of the papules of the eruption proper of smallpox the temperature declines. The eruption of measles further remains essentially papular throughout, while that of smallpox becomes successively vesicular and pustular. Catarrhal symptoms are earlier and usually more pronounced in measles than in smallpox. The latter is the longer disease.

There may be a close resemblance between typhus fever and smallpox at the beginning of each disease, but the eruption of the latter appears a day or two later than that of the former, usually avoids the face, does not become pustular, is often in part petechial, and the temperature does not decline with its appearance. The total duration of typhus fever is considerably less than that of smallpox.

In the headache, the pain in the back and the extremities, and the febrile symptoms, typhoid fever may at first be suggested in a case of smallpox. Epistaxis and diarrhea are, however, likely to be wanting in the latter, the onset of which is usually abrupt, while that of typhoid fever is insidious and gradual. Apart from the marked differences in the character and the course of the eruption that of smallpox appears earlier than that of typhoid fever, and its appearance is attended with decline in temperature and subsidence of the other febrile symptoms. The diazo reaction of the urine and the Gruber-Widal reaction of the blood are peculiar to typhoid fever, and the subsequent course of the two diseases is sufficiently distinct to prevent mistake.

The scarlatiniform rash, sometimes present early in cases of smallpox, and which may be suggestive of scarlet fever, is generally replaced on the third or the fourth day by papules, which in turn become vesicles and pustules. Rupture and desiccation occur in smallpox, and desquamation often in large flakes or sheets in scarlet fever. Further, sore throat with deposits on the tonsils or in the pharynx, enlarged cervical or submaxillary lymphatic glands, and a "strawberry tongue," are peculiar to scarlet fever; whereas in smallpox headache and backache are the more conspicuous.

The rash of erysipelas differs from the early roseola of smallpox in being circumscribed and indurated, and not succeeded by an eruption of papules, vesicles, and pustules, but terminating in desquamation, sometimes after the formation of blebs.

Contagious impetigo is an afebrile cutaneous disorder, attended from the onset with vesico-pustules on apparently healthy skin. The lesion is large, flat, and superficial, and on disappearing leaves no scar. The disease is communicated only by contact or direct inoculation, and it may spread by auto-inoculation.

The pustular syphilide may bear a close resemblance to the eruption of smallpox, but it occurs in crops, is more superficial, is less indurated, is usually free from umbilication, exhibits no tendency to ulceration, is unattended with dermatitis, and is usually associated with a coppery discoloration of the skin, and other symptoms of syphilis, particularly granular enlargement. Much the same points of differentiation will aid in the separation of smallpox and other syphilitic eruptions.

Smallpox and such disorders as cerebrospinal meningitis, influenza, r  theln, and various erythematous conditions of the skin may for a time be confounded, but a careful scrutiny of the patient, a consideration of its associations, and the further development of the clinical picture, will in almost all cases clear up any doubt that there may have been in the diagnosis. A knowledge of the existence of other cases of smallpox, a history of exposure to infection and the absence of evidence of successful vaccination and revaccination may be important factors in reaching a decision. Error can only be avoided, however, by being constantly on one's guard and always prepared for the unexpected and the expected alike.

MULTIPLE AMYLOID TUMORS OF UPPER AIR-PASSAGES.

So-called amyloid tumors occur most frequently in the conjunctiva. They are in reality for the most part local amyloid infiltrations of granulation and hyperplastic connective tissue. In some cases the amyloid substance is present in small masses, in others larger nodules are formed that consist almost exclusively of amyloid material, and acquire a wooden hardness. Tumor-like accumulations of amyloid also develop more independently and without any evident association with inflammatory processes.

Next in frequency are amyloid tumors of the upper air-passages. These peculiar pathologic products belong to the more infrequent formations. Instances of occurrence in the trachea and the larynx are described by Burow, Balser, Kraus and Zeigler; partly solitary, partly multiple masses or tumors, sessile or pedunculated, were present in the submucous tissue of the parts mentioned; in some cases amyloid accumulations also occurred in the tongue. Recently Manasse¹ recorded two instructive cases of this disease. In the first there was

¹ Virchow's Archiv, 1900, vol. cliz, p. 117.

